TANZANIA DISTANCE LEARNING ASSESSMENT

ASSESSING THE USE OF DISTANCE LEARNING TO TRAIN HEALTH CARE WORKERS IN TANZANIA

Report of Findings
March 2009
Tanzania Distance Learning Assessment

Assessing the Use of Distance Learning to Train Health Care Workers in Tanzania

Anya Nartker, Alyson Shumays, Liz Stevens, Katy Potter, Martin Kalowela, Daniel Kisimbo, Agnes Kinemo, Jack Egan
To cite this publication: International Training and Education Center on HIV (I-TECH). Tanzania Distance Learning Assessment: Assessing the Use of Distance Learning to Train Health Care Workers in Tanzania. 2009. Available at: http://www.go2itech.org/resources/publications-presentations/

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Acknowledgments

I-TECH undertook this assessment with funding from the President’s Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA) Cooperative Agreement No. 6 U91 HA 06801, in collaboration with the U.S. Centers for Disease Control and Prevention’s Global AIDS Programme (CDC/GAP) Tanzania.

This report is the product of months of intensive communication, consultation, observation, and reflection with many individuals dedicated to providing insight into high-quality health care worker training in Tanzania. Credit and thanks go to key stakeholders in the Tanzania Ministry of Health and Social Welfare (MoHSW), including the Human Resource Development Division (HRD); the National AIDS Control Programme (NACP); Zonal Health Resource Centres in Morogoro, Arusha, Mwanza, and Kigoma; the Centre for Distance Education, Morogoro; and Clinical Assistant and Clinical Officer Training Centres in Maswa, Kilosa, and Kigoma.

Sincere gratitude also goes to the other organisations and educational institutes in Tanzania that allowed the assessment teams to conduct interviews and observations at their sites. They include Zanzibar MoHSW, international partners working in HIV and AIDS care and treatment, Aga Khan University, Zanzibar Nurses Association (ZANA), the World Health Organisation, the International Institute for Communication and Development (IICD), InWEnt, Harvard University’s HOPE Project, Muhimbili University of Health and Allied Sciences, Open University of Tanzania, AHADI Institute, SoftTech, Aim Consultants, Phones for Health, Ifakara Health Institute, and Tanzania Global Development Learning Centre. Additional thanks go to I-TECH-Tanzania and to I-TECH offices throughout the network, Cardiff University, Réseau en Afrique Francophone pour la Télémédecine (RAFT), Mildmay Centre in Uganda, and HIV eDucation for the support, interest, time, and insights provided during this assessment. Without their permission, assistance, and willingness to allow I-TECH staff to observe, interview, and discuss distance learning, this assessment would not have been possible. A special asante sana is extended to the programme managers, tutors, students, and information technology specialists who took time out of their busy schedules to discuss distance learning with the assessment teams.

Special thanks go to assessment team members Ramadhan Hamza Chande, Jack Egan, Martin Kalowela, Agnes Kinemo, Daniel Kisimbo, Juma Luginga, Anya Nartker, and Liz Stevens, as well as others at I-TECH who assisted in compiling this report, including Flavian Magari, Alyson Shumays, Katy Potter, Tumaini Charles, Mya Gordon, Maureen Sarewitz, and Amanda Marr. In addition, heartfelt appreciation goes to Rona Briere and her assistant, Alisa Decatur, for their skillful editing of this entire report.

Additionally, CDC/GAP Tanzania must be credited for their unflagging support and financial commitment to this assessment. In particular, thanks to Suzzane McQueen and Angela Makota for their helpful suggestions and guidance throughout this assessment.

It is hoped that this assessment and the proposed modifications to distance learning will result in constructive changes that will ultimately lead to better health care worker education, improved patient care outcomes, and better quality of life for the citizens of Tanzania.
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# Abbreviations and Acronyms

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<th>Description</th>
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<tbody>
<tr>
<td>ADSL</td>
<td>asymmetric digital subscriber line</td>
</tr>
<tr>
<td>AED</td>
<td>Academy for Educational Development</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>AKU</td>
<td>Aga Khan University</td>
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<tr>
<td>AMO</td>
<td>assistant medical officer</td>
</tr>
<tr>
<td>AMOTC</td>
<td>Assistant Medical Officer Training Centre</td>
</tr>
<tr>
<td>AMREF</td>
<td>African Medical and Research Foundation</td>
</tr>
<tr>
<td>ANC</td>
<td>ante-natal clinic</td>
</tr>
<tr>
<td>ART</td>
<td>anti-retroviral therapy</td>
</tr>
<tr>
<td>ARV</td>
<td>anti-retroviral</td>
</tr>
<tr>
<td>ASDL</td>
<td>asymmetric digital subscriber line</td>
</tr>
<tr>
<td>BJMC</td>
<td>Byramji Jeejeebhoy Medical College</td>
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<tr>
<td>CA</td>
<td>clinical assistant</td>
</tr>
<tr>
<td>CAT</td>
<td>computer-assisted tomography</td>
</tr>
<tr>
<td>CATC</td>
<td>Clinical Assistant Training Centre</td>
</tr>
<tr>
<td>CBT/CBL</td>
<td>computer-based training/computer-based learning</td>
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<tr>
<td>CCGHE</td>
<td>John Hopkins Center for Clinical Global Health Education</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>compact disc read-only memory</td>
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<tr>
<td>CDC</td>
<td>U.S. Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CDE</td>
<td>Centre for Distance Education</td>
</tr>
<tr>
<td>CE</td>
<td>continuing education</td>
</tr>
<tr>
<td>CEC</td>
<td>Continuing Education Committee</td>
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<tr>
<td>CEDHA</td>
<td>Centre for Educational Development in Health Arusha</td>
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<tr>
<td>CEEU</td>
<td>Continuing Education Unit</td>
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<tr>
<td>CHLI</td>
<td>Caribbean Health Leadership Institute</td>
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<td>CHMT</td>
<td>Council Health Management Team</td>
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<td>CHS</td>
<td>College of Health Sciences</td>
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<tr>
<td>CHW</td>
<td>community health worker</td>
</tr>
<tr>
<td>CTLT</td>
<td>Centre for Teaching and Learning with Technology</td>
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<tr>
<td>CME</td>
<td>continuing medical education</td>
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<tr>
<td>CO</td>
<td>clinical officer</td>
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<tr>
<td>COTC</td>
<td>Clinical Officer Training Centre</td>
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<tr>
<td>CTC</td>
<td>Care and Treatment Clinic</td>
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<tr>
<td>COTUL</td>
<td>Consortium of Tanzania University and Research Libraries</td>
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<tr>
<td>CSSC</td>
<td>Christian Social Services Commission</td>
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<tr>
<td>DANIDA</td>
<td>Danish International Development Agency</td>
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<tr>
<td>DHMT</td>
<td>District Health Management Team (Zanzibar)</td>
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<td>DHIS</td>
<td>District Health Information System</td>
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<tr>
<td>DHO</td>
<td>district health officer</td>
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</tbody>
</table>
DMO  district medical officer
DVC  digital videoconferencing
DVD  digital video disc

EASSy  Eastern Africa Submarine Cable System
EGPAF  Elizabeth Glaser Paediatric AIDS Foundation
ELCT  Evangelical Lutheran Church in Tanzania
EMIS  education management information system
EN  enrolled nurse

FBO  faith-based organisation

GAP  CDC Global AIDS Program
GC21  Global Campus 21
GOT  Government of Tanzania
GPRS  general packet radio services
GPS  Global Positioning System
GTZ  Gesellschaft für Technische Zusammenarbeit (German Society for Technical Cooperation)

HCW  health care worker
HINARI  Health InterNetwork Access to Research
HIV  human immunodeficiency virus
HMIS  health management information system
HOPE  Harvard University HIV Online Provider Education
HRD  MoHSW’s Human Resource Development Department
HRH  Human Resources for Health
HRSA  U.S. Health Resources and Services Administration
HTI  Health Training Institution

ICAP  International Center for AIDS Care and Treatment Programs at Columbia University
ICATT  IMCI Computerised Adaptation and Training Tool
ICT  information and communication technology
ID  Infectious Disease
IDSR  Integrated Disease Surveillance and Response
IICD  International Institute for Communication and Development
IMCI  Integrated Management of Childhood Illness
ISDN  integrated services digital network
InWEnt  International Weiterbildung und Entwicklung gGmbH (Capacity Building International)
IP  Internet Protocol
ISDN  Integrated Services Digital Network
ISP  internet service provider
IT  information technology
I-TECH  International Training and Education Center on HIV

KCMC  Kilimanjaro Christian Medical Centre
<table>
<thead>
<tr>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>LAN</td>
<td>local area network</td>
</tr>
<tr>
<td>LCD</td>
<td>liquid crystal display</td>
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<tr>
<td>LINGOses</td>
<td>Learning for International Non-Governmental Organisations</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MCHA</td>
<td>maternal and child health aide</td>
</tr>
<tr>
<td>MEDA</td>
<td>Mennonite Education and Development Association</td>
</tr>
<tr>
<td>MMAM</td>
<td>Mpango wa Maendeleo wa Afya ya Msingi (MoHSW’s Primary Health Services Development Programme)</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Education</td>
</tr>
<tr>
<td>MoHSS</td>
<td>Namibia Ministry of Health and Social Services</td>
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<tr>
<td>MoHSW</td>
<td>Ministry of Health and Social Welfare</td>
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<tr>
<td>MoPH</td>
<td>Ministry of Planning Economy and Empowerment</td>
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<tr>
<td>MPH</td>
<td>master of public health</td>
</tr>
<tr>
<td>MUHAS</td>
<td>Muhimbili University of Health and Allied Sciences</td>
</tr>
<tr>
<td>MuHEF</td>
<td>Muhimbili Health Exchange Forum</td>
</tr>
<tr>
<td>MTN</td>
<td>mobile telephone network</td>
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<tr>
<td>MRI</td>
<td>magnetic resonance imaging</td>
</tr>
<tr>
<td>NACA</td>
<td>National AIDS Coordinating Agency</td>
</tr>
<tr>
<td>NACP</td>
<td>National AIDS Control Programme</td>
</tr>
<tr>
<td>NACTE</td>
<td>National Council for Technical Education</td>
</tr>
<tr>
<td>NARI</td>
<td>National AIDS Research Institute of India</td>
</tr>
<tr>
<td>NETTS</td>
<td>National Expansion of TEHIP Tools Strategy</td>
</tr>
<tr>
<td>NGO</td>
<td>non-governmental organisation</td>
</tr>
<tr>
<td>NHTC</td>
<td>National Health Training Centre</td>
</tr>
<tr>
<td>NIMR</td>
<td>National Institute for Medical Research</td>
</tr>
<tr>
<td>NREN</td>
<td>National Research and Education Networks</td>
</tr>
<tr>
<td>NTC</td>
<td>Nurse Training Centre</td>
</tr>
<tr>
<td>OPD</td>
<td>outpatient department</td>
</tr>
<tr>
<td>OUT</td>
<td>Open University of Tanzania</td>
</tr>
<tr>
<td>PABX</td>
<td>private automatic branch exchange</td>
</tr>
<tr>
<td>PATH</td>
<td>Program for Appropriate Technology in Health</td>
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<tr>
<td>PC</td>
<td>personal computer</td>
</tr>
<tr>
<td>PDA</td>
<td>personal digital assistant</td>
</tr>
<tr>
<td>PDF</td>
<td>portable document format</td>
</tr>
<tr>
<td>PEP</td>
<td>post-exposure prophylaxis</td>
</tr>
<tr>
<td>PHCC</td>
<td>Primary Health Care Centre (Zanzibar)</td>
</tr>
<tr>
<td>PHCU</td>
<td>Primary Health Care Unit (Zanzibar)</td>
</tr>
<tr>
<td>PHN</td>
<td>public health nurse</td>
</tr>
<tr>
<td>PHNA</td>
<td>public health nurse assistant</td>
</tr>
<tr>
<td>PHSDP</td>
<td>Primary Health Services Development Programme</td>
</tr>
<tr>
<td>PLHIV</td>
<td>people living with HIV</td>
</tr>
<tr>
<td>PMTCT</td>
<td>prevention of mother-to-child transmission</td>
</tr>
<tr>
<td>POC-IT</td>
<td>John Hopkins Point of Care Information Technology</td>
</tr>
<tr>
<td>PSI</td>
<td>Population Services International</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>RAFT</td>
<td>Réseau en Afrique Francophone pour la Télémédicine</td>
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<tr>
<td>RCH</td>
<td>reproductive child health</td>
</tr>
<tr>
<td>RHMT</td>
<td>Regional Health Management Team</td>
</tr>
<tr>
<td>RLC</td>
<td>Regional Learning Centre</td>
</tr>
<tr>
<td>RMA</td>
<td>rural medical aide</td>
</tr>
<tr>
<td>RN</td>
<td>registered nurse</td>
</tr>
<tr>
<td>SACOL</td>
<td>South African College for Open Learning</td>
</tr>
<tr>
<td>SHM</td>
<td>Strengthening Health Management</td>
</tr>
<tr>
<td>SMS</td>
<td>short message service</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infection</td>
</tr>
<tr>
<td>TANESCO</td>
<td>Tanzania Electrical Supply Company</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TCRA</td>
<td>Tanzania Communications Regulatory Authority</td>
</tr>
<tr>
<td>TEAMS</td>
<td>The East African Marine System</td>
</tr>
<tr>
<td>TEHIP</td>
<td>Tanzania Essential Health Interventions Programme</td>
</tr>
<tr>
<td>TERNET</td>
<td>Tanzania Education and Research Network</td>
</tr>
<tr>
<td>TGDLC</td>
<td>Tanzania Global Development Learning Centre</td>
</tr>
<tr>
<td>THMIS</td>
<td>Tanzania HIV/AIDS and Malaria Indicator Survey</td>
</tr>
<tr>
<td>TNMC</td>
<td>Tanzania Nurses and Midwives Council</td>
</tr>
<tr>
<td>TOT</td>
<td>training of trainers</td>
</tr>
<tr>
<td>TSH</td>
<td>Tanzanian shilling</td>
</tr>
<tr>
<td>TRC</td>
<td>Tanzania Railways Corporation</td>
</tr>
<tr>
<td>TTCL</td>
<td>Tanzania Telecommunications Company Limited</td>
</tr>
<tr>
<td>TUSK</td>
<td>Tufts University Sciences Knowledgebase</td>
</tr>
<tr>
<td>UCSD</td>
<td>University of California, San Diego</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
</tr>
<tr>
<td>UNISA</td>
<td>University of South Africa</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>United Nations Joint Programme on HIV/AIDS</td>
</tr>
<tr>
<td>USB</td>
<td>universal serial bus</td>
</tr>
<tr>
<td>USD</td>
<td>United States dollar</td>
</tr>
<tr>
<td>USG</td>
<td>United States Government</td>
</tr>
<tr>
<td>UWI</td>
<td>University of West Indies</td>
</tr>
<tr>
<td>VCT</td>
<td>voluntary counselling and testing</td>
</tr>
<tr>
<td>VOIP</td>
<td>voice over internet protocol</td>
</tr>
<tr>
<td>VSAT</td>
<td>very small aperture terminal</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>WWW</td>
<td>World Wide Web</td>
</tr>
<tr>
<td>ZANA</td>
<td>Zanzibar Nurses Association</td>
</tr>
<tr>
<td>ZHRC</td>
<td>Zonal Health Resource Centre</td>
</tr>
<tr>
<td>ZJMIP</td>
<td>Zanzibar Joint Ministries Internet Project</td>
</tr>
</tbody>
</table>
Executive Summary

This report presents the results of an assessment of the use of distance learning to alleviate the shortage of health care workers in Tanzania. This assessment was funded by the President’s Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Centers for Disease Control and Prevention’s Global AIDS Programme (CDC/GAP) Tanzania and the Health Resources and Services Administration (HRSA).

The assessment, conducted during May–August 2008 by the International Training & Education Centre on HIV (I-TECH) in collaboration with the Tanzania Ministry of Health and Social Welfare (MoHSW), entailed gathering information on current distance learning programmes in Tanzania, in other African countries, and within the I-TECH network, as well as on the demand for and practical considerations involved in implementing such programmes for Tanzania’s health care workers.

TANZANIA’S HEALTH CARE WORKER SHORTAGE

Tanzania is experiencing a severe shortage of health care workers. The Ministry of Health and Social Welfare (MoHSW) estimates that as of 2006, the health care system was operating with a 65 per cent shortage of the required skilled workforce (MoHSW, 2006). In addition, the MoHSW has launched a 10-year programme to ensure that all Tanzanians have access to health care services. This programme—the Mpango wa Maendeleo wa Afya ya Msingi (MMAM), or Primary Health Services Development Programme (PHSDP)—is intended to expand and improve the provision of health services (curative, preventive, and rehabilitative) to the level of every village and every ward. Meeting this mandate will create the need for even more qualified health care workers. The MoHSW estimates that with MMAM, the need will rise to 80,659 by 2017 (MoHSW, 2007a), whereas the current health care workforce totals just 29,063.

The adverse impacts of the shortage of health care workers are apparent at every level of the health care system, and are magnified by the continued high burden of HIV and other diseases in Tanzania. The availability of health care workers is at the heart of all efforts to meet increased demand for HIV and AIDS prevention, care, and treatment services. The MoHSW is asking Health Training Institutions (HTIs) to double their enrolment, and is asking the national Centre for Distance Education (CDE), based in Morogoro, to scale up its upgrade programmes for health care workers to cover the entire nation.

The growing need for qualified health care workers requires inventive approaches to training that are both effective and economical. Distance learning has the potential to be used for upgrading existing health care workers to a new level of qualification and for providing continuing education aimed at strengthening knowledge and skills to apply new or improve existing practices.

It is against this background that I-TECH, with support from PEPFAR and in collaboration with the MoHSW, conducted an assessment of distance learning activities in Tanzania.
ASSESSMENT OBJECTIVES

The assessment had five objectives:

- Determine the feasibility of and demand for distance learning in Tanzania to meet the current need for skilled and qualified health care workers.
- Create a detailed inventory of distance learning programmes in Tanzania, including their achievements and challenges.
- Describe the training that distance learning could provide, and identify the potential cadres that could benefit from new or expanded distance learning programmes.
- Determine whether and how distance learning can address the shortage of qualified health care workers available to deliver HIV and AIDS services in Tanzania.
- Explore the feasibility of using digital videoconferencing among Zonal Health Resource Centres (ZHRCs) for distance learning and for other key interventions.

METHODS

A variety of methods were used to obtain a comprehensive picture of the distance learning landscape in Tanzania. Components of the assessment included the following:

- A desk review of distance learning programmes across Tanzania and southern Africa, as well as the I-TECH network, the University of Washington, and their partners in other countries
- Programme-level surveys of organisations working in countries with contexts similar to that of Tanzania (13)
- Interviews with programme managers (22), distance learning programme tutors (8), distance learning students (34), information technology (IT) specialists supporting distance learning programmes (9), distance learning preceptors (4), and MoHSW representatives (2) across 25 programmes
- Surveys distributed to health care workers (46)
- Focus group discussion conducted with representatives of seven different HIV care and treatment partners
- Observations of distance learning activities, such as face-to-face tutorials and live synchronous sessions (4)
- Collection of distance learning curricula and course materials, as well as programme reports, evaluations, and marketing materials where possible

On-site observations were conducted in the following eight locations in Tanzania: Arusha, Dar es Salaam, Kigoma, Kilosa, Maswa, Morogoro, Mwanza, and Zanzibar.

RESULTS

Achievements, Benefits, Challenges, and Constraints

The assessment revealed many achievements and benefits of distance learning programmes for health care workers in Tanzania. The most significant achievements include the establishment of the CDE for the development and implementation of such programmes, the recent growth of print-based distance learning programmes for upgrading health care
workers, the MoHSW’s recognition of distance learning as an effective method for training and addressing shortages of health care workers, and initiation of the use of more technologically advanced distance learning platforms. In addition, there is great enthusiasm for distance learning among current and potential distance learning students because the programme structure allows them to remain employed in their communities and support their families while advancing their careers.

At the same time, distance learning in Tanzania faces many challenges and constraints. These include bureaucratic impediments, which inhibit effective planning and coordination of national distance learning programmes; a lack of guidance and support for staff and students involved in programmes; and funding constraints and poor infrastructure, such as a lack of space for classes and limited course materials. Additional challenges and constraints include personnel shortages, insufficient training for programme personnel, and a lack of monitoring and evaluation plans.

**Feasibility of Distance Learning in Tanzania**

Print-, computer-, internet-, and mobile phone–based distance learning modalities were examined for this assessment. Results indicate that print-based distance learning is an appropriate and effective modality for Tanzania; it has proven feasible and is currently operational. The main constraint is limited availability of course materials for students because of the cost of printing and the unreliability of the postal service.

Computer- and internet-based distance learning modalities face more serious constraints, related primarily to students’ poor computer access and limited computer skills, in addition to Tanzania’s varying degrees of electricity coverage. The high cost and slow speed of internet access also inhibit the delivery of internet-based courses.

Although high-end digital videoconferencing is possible, it is not feasible for use in most programmes at this time given the cost of high-speed internet service and problems with sustained connectivity. Low-end videoconferencing (through internet-based platforms such as Adobe Connect Pro Live and Elluminate) may be feasible and was recently piloted and implemented by the Zanzibar MoHSW and the CDE for use in the Aga Khan University distance learning enrolled nurse to registered nurse upgrade programme.

The assessment revealed that mobile phone technology offers increasing potential for training health care workers, especially in the absence of computers and internet access for students. An organisation in Tanzania is currently using phones to send tests and quizzes to students. Most students interviewed own mobile phones and use them to communicate with classmates and tutors.

**Capacity of Zonal Health Resource Centres to Conduct Distance Learning Programmes**

Assessment teams visited four of the eight ZHRCs: Northern ZHRC in Arusha, Lake ZHRC in Mwanza, Eastern ZHRC in Morogoro, and Western ZHRC in Kigoma. The Zanzibar MoHSW Continuing Education Unit was also visited. Interviews revealed that most ZHRCs do not interface with the CDE on distance learning programmes, aside from coordinating the proctoring of exams, although all ZHRC managers interviewed said they would like to take a larger role in programme coordination (given an increase in funding).
The assessment identified a number of factors that affect the ability of the ZHRCs to implement distance learning activities:

- Inadequate resources (financial and staffing) to meet the high demand for upgrading through distance learning
- Inadequate capacity of both ZHRCs and HTI study centres to implement distance learning and support students
- Inadequately trained distance learning tutors and preceptors
- Inadequate publicising of distance learning to various stakeholders in the zones, including employers at health care facilities

Despite the challenges that currently limit the involvement of the ZHRCs in distance learning activities with the CDE, managers interviewed expressed enthusiasm for conducting distance learning programmes and their belief that their regions could benefit from expansion of these programmes.

**Demand for Distance Learning for Health Care Workers in Tanzania and Potential Cadres to be Trained**

The assessment revealed substantial demand for distance learning programmes in Tanzania. Feedback from students, programme managers, health care workers, preceptors, and focus group participants suggests that there is a critical need to expand and strengthen existing in-service distance learning upgrade programmes. Once this need has been met, it may be possible to explore the use of distance learning for new initiatives such as pre-service training, perhaps by piloting such a programme. Priority cadres to be targeted for distance learning include lower-level cadres needed to staff primary care–level health facilities, such as nurses, clinical officers, and clinical assistants.

The vast majority of health care workers surveyed (91 per cent) expressed interest in participating in a distance learning upgrade programme if one were available in their region. The most commonly mentioned degree programmes for advancement were for nursing (RN), master of public health (MPH), and assistant medical officer (AMO).

Results also suggest that distance learning could play an important role in providing continuing education, such as short courses or refresher training. Distance learning could also be used to provide updates to students on cutting-edge developments, particularly for a topic that is subject to frequent changes, such as HIV and AIDS.

**RECOMMENDATIONS**

Following is a summary of the recommendations offered in this report. Part III of the report presents these recommendations in greater detail.

1. Provide adequate funding and infrastructure to the national CDE in Morogoro so it can better coordinate distance learning activities in Tanzania.

- Improve the physical infrastructure of the CDE to create space for conduct of the activities necessary to run a national distance learning centre.
• Increase human resources at the CDE. The first priority should be administrative and programme coordination personnel: a zonal distance learning coordinator, a study centre coordinator, a practicum coordinator, a resource centre coordinator, a training materials development specialist, a faculty training coordinator, and an accountant. Other positions, such as distance learning tutors and preceptors, IT specialists, and staff for a Distance Learning Training Unit and a Health Materials Development Unit, should also be considered.

• Ensure adequate funding for the CDE and its activities:
  – Ensure that budget allocations are in line with targets for the CDE.
  – Allow funds allocated for distance learning to support activities of ZHRCs and HTIs involved in distance learning programmes.
  – Explore other options for funding distance learning activities. MoHSW funding may not be sufficient to achieve the goals of MMAM. Grants and funding from partners both within and outside of Tanzania might be explored.
  – Provide adequate compensation to attract, motivate, and retain preceptors and tutors.
  – Provide adequate support for students, for example, by giving them a stipend to cover a portion of such expenses as photocopying, use of internet cafés, and travel.

• Improve programme coordination:
  – Bring together ZHRC and HTI distance learning coordinators on a semi-annual basis to discuss challenges, share lessons learned, and plan for the future.
  – Improve mechanisms for programmatic student support. Provide students with responsive coordinators who can support and advocate for them and communicate their needs to programme managers. Ensure that students and tutors have contact details to maintain this communication and support.
  – Create documents that detail the roles and responsibilities of tutors and preceptors.
  – Provide training and orientation to tutors and preceptors.
  – Build strong systems for feedback between students and tutors. Institute a system for communicating feedback at regular intervals to create avenues for learning and discussion in particular areas in which students may be struggling.
  – Encourage employers to support distance learning students, for example, by allowing them time off for face-to-face sessions and giving them access to computers at their job site.
  – Improve monitoring and evaluation of programmes.

• Develop a marketing plan that includes creation of a CDE website and printed materials.

2. Decentralise distance learning zonal coordination functions, programmatic roles and responsibilities, and learner support to the ZHRCs.

• Provide adequate funding to the ZHRCs to support their assumption of these responsibilities.
• Utilise computer labs and resource centres at the ZHRCs for distance learning activities.
• Allocate funding in ZHRC budgets to address IT needs for distance learning.
• Decrease costs for internet access at the ZHRCs. The MoHSW may be able to negotiate with Tanzania Telecommunications Company Limited (TTCL) for reduced tariffs, thus reducing communication costs for the ZHRCs. An alternative to costly
very small aperture terminals (VSATs) for communicating across the ZHRCs would be the use of leased lines.

- Reinstate the Centre for Educational Development in Health Arusha (CEDHA) e-collaboration project among the ZHRCs, with leadership from the MoHSW and the CDE.
- Seek direct funding for distance learning activities from donors.
- Include Zanzibar in all of the CDE’s distance learning activities.

3. **Provide adequate support to the HTIs working with the national distance learning programme as study centres and to the health care facilities that serve as practicum sites.**

- Provide adequate funding to increase the capacity of the HTI study centres to support distant learning students.
- Increase the number of HTIs acting as study centres for distance learning programmes.

4. **Enhance and expand existing distance learning programmes and the development of training materials.** Given the challenges identified above regarding existing upgrade programmes, it is important to enhance the structure and materials of current low-tech, print-based upgrade programmes so students can benefit fully from distance learning in the near term. The following steps could be taken collaboratively by the CDE, the ZHRCs, and the HTIs:

- Create standardised training and orientation packages for distance learning tutors and preceptors.
- Create an orientation package for students.
- Develop a standardised computer training package for distance learning students and tutors.
- Develop a training package in English-language skills. An intensive course could be held prior to the start of their studies for students deemed to need additional English-language support. Throughout the programme, students should have the opportunity to improve their skills or receive special tutoring or support in English if needed. It may be possible to adapt training for English-language tutors or curricula for these courses from existing resources or programmes (for example, the Ministry of Education’s English-language training).
- Strengthen distance learning curricula and training materials:
  - Ensure that curricula are appropriate to the Tanzanian context.
  - Ensure that distance learning curricula and training materials are in line with their counterparts in residential programmes. For example, the clinical assistant and clinical officer curricula were revised by the MoHSW in 2007–2008, but the clinical assistant to clinical officer distance learning upgrade programme has yet to be revised accordingly.
  - Develop competencies and learning objectives for programmes.
  - Develop a detailed timetable/schedule.
  - Develop projects and activities that require students to work together.
  - Strengthen and update HIV, AIDS, TB, TB/HIV, malaria, and other important health content in distance learning curricula.
- Increase face-to-face sessions.
EXECUTIVE SUMMARY

• Increase students’ access to materials in Kiswahili to help reinforce learning.
• Ensure that students receive required materials in a timely manner.
• If computers and internet access are required for students in the programme, ensure that they are available, accessible, and affordable.
• Consider building more advanced technologies into training programmes and materials.
• Prioritise particular cadres for distance learning.

5. Create new distance learning programmes to upgrade, motivate, expand, and retain current cadres of health care workers in Tanzania. Once current distance learning programmes have been strengthened, new initiatives will be needed to upgrade, motivate, expand, and retain health care workers in Tanzania.

• Create distance learning short courses for use in continuing education for health care workers, and enlist the ZHRCs to conduct and coordinate these courses.
• Expand existing programmes and develop additional in-service upgrade programmes, giving priority to cadres that will help the MoHSW reach the MMAM goals.
• Pilot low-end technologies that provide synchronous two-way interaction and communication for students and the ZHRCs.
• Use and integrate free, existing distance learning resources and training materials to create new programmes or enhance curricula of current programmes.
• Create and pilot a distance learning component for use in pre-service training.

6. Form an advisory body of distance learning stakeholders to develop a strategic plan and vision for distance learning, develop new programmes, create materials, share resources, provide funding, and support distance learning activities in Tanzania.

• The MoHSW and the CDE should bring together a group of distance learning stakeholders as well as interested donors to create a strategic plan and vision to support distance learning in Tanzania.
• Collaborate with major resource centres, e-learning centres, ZHRC computer labs, community-based telecentres, and distance learning programmes to share resources.
• Build more partnerships with training organisations and academic institutions to improve curricular materials and the monitoring and evaluation of distance learning programmes.

SOME FINAL WORDS

Distance learning programmes hold great potential to increase the motivation, knowledge, and skills of Tanzania’s current health care workforce and to reduce the country’s national shortage of health care workers. This assessment revealed that distance learning programmes in Tanzania face numerous challenges and constraints. However, if resources for distance learning are increased and if stakeholders commit to collaborating across programmes to share best practices and lessons learned, existing programmes can be improved and new and improved programmes developed. Accomplishing this would be key in increasing the numbers of qualified health care workers capable of meeting the health care needs of the Tanzanian population.
Part I
Introduction, Background, and Methods
1

Introduction

In Tanzania there is a severe shortage of health care workers to address the health care needs of the population. The Ministry of Health and Social Welfare (MoHSW) estimates that as of 2006, the health care system was operating with just 65 per cent of the required skilled workforce—a total of 29,063 health care workers (MoHSW, 2006). This shortage will be exacerbated as the result of a 10-year programme initiated by the MoHSW to ensure that all Tanzanians have access to health care services. This programme, called Mpango wa Maendeleo wa Afya ya Msingi (MMAM), or the Primary Health Services Development Programme (PHSDP), is aimed at expanding and improving the provision of health services (curative, preventive, and rehabilitative) to the level of every village and every ward. The MoHSW estimates that with MMAM, the number of skilled health care workers needed will rise to 80,659 by 2017 (MoHSW, 2007a).

The health care crisis caused by the country’s shortage of health care workers is apparent in every sector of the health care system, and is especially relevant in light of the increased demand for HIV and AIDS prevention, care, and treatment services. The MoHSW is requesting that Health Training Institutions (HTIs) double their enrolment, and the MoHSW national Centre for Distance Education (CDE), based in Morogoro, is being asked to expand its upgrading programmes to cover the entire nation. Meeting these needs will require inventive approaches to training that are both effective and economical.

Against this background and with funding from PEPFAR, the International Training and Education Center on HIV (I-TECH) conducted an assessment of distance learning activities in Tanzania. This assessment examined the utility and potential for development of distance learning in the Tanzanian context. This report presents the assessment results, which serve as the basis for a series of recommendations for moving forward.

OBJECTIVES OF THE DISTANCE LEARNING ASSESSMENT

I-TECH, in collaboration with the MoHSW and the CDC, undertook its assessment of distance learning activities in Tanzania from May through August 2008. The goal of the assessment was to gather information about current distance learning programmes in Tanzania, in other African countries, and within the I-TECH network, as well as to examine practical considerations and demand for implementing such programmes in Tanzania to address the shortage of health care workers. The assessment had five specific objectives:

- Determine the feasibility of and demand for distance learning in Tanzania to meet the current demand for skilled and qualified health care workers.
- Create a detailed inventory of distance learning programmes in Tanzania, including both their achievements and their challenges.
- Describe the training areas such programmes could cover, and identify the potential cadres of workers that could benefit from new or expanded programmes.
- Determine whether and how distance learning methods can address the shortage of health care workers qualified to deliver HIV and AIDS services.
- Explore the feasibility of utilising digital videoconferencing among Zonal Health Resource Centres (ZHRCs, formerly known as Zonal Training Centres) for distance learning and for other key interventions.

**DEFINITION OF DISTANCE LEARNING**

Distance learning, often synonymous with distance education, can be defined as learning that takes place with the instructor and learner(s) in physically separate locations. It can be either synchronous (‘live’, meaning interaction between instructor and learners takes place simultaneously, as with videoconferencing) or asynchronous (‘not live’, meaning interaction takes place at different times, as with posting on an internet discussion board or e-mail).

Distance learning uses both print media and a variety of technologies, including computers, mobile phones, and personal digital assistants (PDAs). It can also encompass e-learning, defined as learning that is primarily in an electronic format (i.e., computer-based training), which may or may not involve the internet.

**STRUCTURE OF DISTANCE LEARNING PROGRAMMES FOR HEALTH CARE WORKERS**

The MoHSW in Tanzania began using distance learning strategies in the late 1990s to address the critical shortage of health care workers. Many other organisations have developed such programmes to expand the health care workforce.

According to the above definition, distance learning means that instructor and learner(s) are in separate physical locations. However, a common structure found in distance learning courses for health care workers, particularly those that are long-term in nature and involve some kind of qualification award or upgrade, is called blended or hybrid learning. Such programmes include both a face-to-face and a practical component in addition to the self-study that is characteristic of traditional distance learning programmes.

**Face-to-Face Component**

A distance learning course for health care workers usually begins and ends with a face-to-face component in which the learner meets with the instructor (and usually with other learners) in the same physical location (a classroom or training institution). A course may begin with an orientation that provides an overview of the course structure and materials, along with training in computer skills. A course may end with a consolidation of learning and a final exam. Various face-to-face meetings (formal or informal) may take place as well between instructor and learner(s) and among learners at regular or irregular intervals. During these meetings, instructor and learners participate in classroom-based sessions that can include lectures, slide presentations, discussions, demonstrations, role plays, and case-based learning. The face-to-face component usually is intended to reinforce knowledge and skills gained in the practical and self-study components of the course.
**Practical Component**

Acquisition of clinical skills is necessary in training for health care workers; thus, a practical component, or practicum, overseen by a preceptor is an essential component of distance learning programmes for these workers. In the practicum, learners work with a preceptor at regular intervals (e.g., twice a week) to gain experience in clinical skills. In many cases, learners are also employed in the same clinical setting, but the practicum is separate from their job; learners have a different supervisor and different responsibilities for the practicum and their job.

**Self-Study Component**

The self-study component usually consists of the learner’s using printed materials or various technologies to learn the content. Printed materials may include workbooks, assignments, and tests. In a print-based course, the learner may send completed materials to be graded and receive them back through the regular postal service. As part of a print-based course, the learner may be required to use the computer for typing papers, searching the internet, or e-mailing the instructor or other students, but the primary learning takes place through the printed media. A computer-based course uses a CD-ROM, DVD, or memory stick to display content to the learner. Interactive multi-media may be used to display content, give assignments, and take tests, as well as to access films, audio clips, and resource libraries. An internet-based course may use both synchronous and asynchronous technologies. Synchronous technologies include videoconferencing, instant messaging (e.g., Skype), and an online virtual classroom; asynchronous technologies include discussion boards, virtual workspaces, discussion/posting platforms (e.g., Moodle), and e-mail. During the self-study component, learners may work in study groups with other learners and may also be in communication with instructors via phone or e-mail.

**Other Distance Learning Methods**

In addition to the blended or hybrid approach, the following distance learning methods are used to train health care workers:

- **A webinar**, short for web-based seminar, is a presentation, lecture, workshop, or seminar that is transmitted over the internet. Webinars are live and interactive. Learners can give, receive, and discuss information with the presenter and other learners via chat or audio functions. This is a synchronous modality.
- **Telem medicine** enables health care workers to gain skills in dealing with challenging cases and assisting patients who may not be able to reach referral hospitals. It involves the delivery of health care from a distance using electronic information and technology such as computers, cameras, videoconferencing, the internet, and satellite and wireless communications. Health care workers can upload case histories, images, and questions to a website or send questions via e-mail to experts who will respond.
- **With e-collaboration**, collaboration among people or organisations is enabled by electronic technologies such as the internet, videoconferencing, and wireless devices. When distance is an important factor, health care workers, HTIs, and health care facilities can use such technologies to exchange information for training and continuing education of health care workers, as well as to conduct research and evaluation and to diagnose and treat illness.
ORGANISATION OF THIS REPORT

This report is organised into three parts:

• Part I consists of three chapters:
  – Chapter 1 introduces the report.
  – Chapter 2 provides essential background information as context for the remainder
    of the discussion.
  – Chapter 3 describes the methods used for the assessment.

• Part II presents the results of the assessment:
  – Chapter 4 describes the achievements and benefits of Tanzania’s distance learning
    programmes.
  – Chapter 5 details the challenges and constraints that must be addressed to improve
    and expand those programmes.
  – Chapter 6 examines issues of technological feasibility.
  – Chapter 7 reviews the capacity of Tanzania’s ZHRCs (formerly known as Zonal
    Training Centres) to conduct distance learning programmes.
  – Chapter 8 addresses the demand for distance learning for health care workers in
    Tanzania and the potential cadres of workers to be trained.
  – Chapter 9 presents lessons learned from the site visits conducted for this study and
    from a review of global distance learning programmes.

• Part III contains recommendations based on the results presented in Part II.

The report ends with three appendices: Appendix A provides the tools used for the
assessment; Appendix B details the site visits made and programmes researched for the
study; and Appendix C is a glossary of terms used in this report.
2
Background

The United Republic of Tanzania, located in eastern Africa, covers an area of 947,480 km². It is one of the poorest countries in the world, with a per capita income of USD 400 (World Bank, 2007). The population is estimated at roughly 40 million, with an annual growth rate of 1.8 per cent (UNAIDS, 2008). About 75 per cent of the population lives in rural areas on the mainland; on Zanzibar this figure is 60 per cent. Fully 65 per cent of the population is below age 25 (MoHSW, 2006). These characteristics of the population impact the health care system in several ways, including an ever-increasing need for skilled health care workers willing to work in remote rural settings.

Tanzania is divided into 26 regions: Tanzania mainland encompasses 21 regions, while Zanzibar, which consists of numerous small islands and two main islands, Unguja and Pemba, has 5 regions (see Figure 1). The mainland and Zanzibar have separate government structures, including separate ministries of health.

FIGURE 1 Tanzania’s 26 regions.
HIV AND AIDS AND HEALTH SERVICES IN TANZANIA

HIV and AIDS

Results from the preliminary 2007–2008 Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) indicate that 6 per cent of residents of the Tanzania mainland aged 15–49 are infected with HIV; prevalence is higher among women (7 per cent) than among men (5 per cent). Prevalence varies among regions. Iringa Region has the highest prevalence (14.7 per cent), while Zanzibar has the lowest (0.6 per cent). Prior to the launch of the national HIV testing campaign in July 2007, it was estimated that only about 15 per cent of Tanzanians knew their HIV status. By the end of June 2008, a total of 4,827,096 people had been screened for HIV through the national HIV testing campaign, and overall HIV prevalence was found to be 5.4 per cent (4.6 per cent for males and 6.1 per cent for females)—figures slightly lower than but consistent with the THMIS findings (Tanzania Commission for AIDS [TACAIDS] and the Zanzibar AIDS Commission [ZAC], 2008).

The national HIV testing campaign has led to an increase in the number of people living with HIV (PLHIV) seeking care, treatment, and support. Tanzania started providing antiretroviral therapy (ART) services in November 2004, with a national target of having 440,000 people on ART by the end of 2008. By the end of January 2009, a total of 416,594 people (129,598 men, 251,978 women, 35,018 children) had been enrolled for HIV care and treatment services; 211,362 people (69,511 men, 124,515 women, 17,336 children) had already initiated ART (NACP, 2009).

Tanzania mainland has a generalised epidemic, and the primary mechanism for HIV transmission is unprotected heterosexual intercourse, responsible for about 80 per cent of all new infections. Mother-to-child transmission is estimated to account for about 18 per cent of new infections. In Tanzania mainland, about 1.8 per cent of young persons aged 15–24 who reported never having had sex were found to be HIV positive. This suggests that they were infected through blood transfusion; unsafe injections; or traditional practices, including male circumcision and female genital cutting (UNAIDS, 2008).

In Zanzibar, since the first three HIV/AIDS cases were diagnosed in 1986 at Mnazi Mmoja hospital, the number of reported cases has been on the rise, with women being more infected than men (0.9 per cent vs. 0.2 per cent). Based on the HIV validation survey and Ante-Natal Clinic (ANC) surveillance done in 2002, the HIV prevalence rates in Zanzibar among the general population and ANC clients were 0.6 per cent and 0.9 per cent, respectively (Zanzibar AIDS Commission, 2008). Studies done in Zanzibar indicate that it has a concentrated HIV epidemic. High-risk behaviour among substance users, commercial sex workers, and men who have sex with men has been noted in the islands. Substance users and intravenous drug users in particular have been identified as a highly at-risk population because Zanzibar is located along the major corridor for drug trafficking and has seen an overall increase in drug trafficking activities (Zanzibar AIDS Commission, 2008).

Health Services Structure: Tanzania Mainland

The structure of public-sector health services in the Tanzania mainland encompasses referral/consultation/specialised hospitals at the national level, regional hospitals, health centre services, and dispensary services. Table 1 provides an estimate of the number of health facilities in Tanzania as of 2006. In addition to what is reported below, as of April 2008 there were 366 care and treatment clinics (CTCs) in Tanzania (PEPFAR Tanzania, 2008). As discussed below, severe staffing shortages currently exist in all of these facilities.
TABLE 1  Health Facilities in Tanzania by Type

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Public Sector</th>
<th>Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government</td>
<td>Parastatal</td>
</tr>
<tr>
<td>Hospitals</td>
<td>87</td>
<td>8</td>
</tr>
<tr>
<td>Health Centres</td>
<td>331</td>
<td>10</td>
</tr>
<tr>
<td>Dispensaries</td>
<td>3,038</td>
<td>145</td>
</tr>
<tr>
<td><strong>Total Number of Health Facilities</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**National Level: Referral/Consultation/Specialised Hospitals**

These hospitals represent the highest level of hospital services in the country. They include four referral hospitals—Muhimbili National Hospital, Kilimanjaro Christian Medical Centre, Bugando Medical Hospital, and Mbeya Hospital—and four specialised hospitals that provide psychiatry, tuberculosis (TB), orthopaedic/trauma, and cancer care.

**Regional Hospitals**

There are 21 regional hospitals, 1 for each region, serving a population of about 1,000,000. As Level II facilities, they act as a referral point for district hospitals for more specialised care.

**District Hospitals**

Each of the 114 districts is supposed to have a district hospital that provides what is termed Level I hospital care, although currently only 95 districts have such a facility. The district hospitals are led by a Council Health Management Team under the direction of a District Executive Director. The team also interacts with nongovernmental organisations (NGOs) and faith-based organisations (FBOs), and contracts with private health care facilities in the vicinity for additional help if needed.

**Health Centre Services**

A health centre is expected to cater to 50,000 people, which is approximately the population of one administrative division or ward. A standard health centre consists of an outpatient department, a maternal and child health (MCH) clinic, a 24-bed medical ward, an obstetrics theatre, diagnostic services, and a mortuary, with a minimum of ten staff quarters. MCH services are lacking in 40 per cent of health centres, and adequate staff housing in 30 per cent (MoHSW, 2007a).

**Dispensary Services**

A dispensary serves 6,000–10,000 people. A standard dispensary should have an outpatient department, MCH services, and housing for two staff. According to MoHSW reports, however, 70 per cent of dispensaries lack space for MCH services, and 80 per cent of dispensaries lack adequate staff housing (MoHSW, 2007a).
Staffing Requirements vs. Availability

Tables 2 and 3 show the required vs. available numbers of health care workers at each type of public- and private-sector facility, respectively. Note that faith-based and private facilities that operate in collaboration with the MoHSW are counted in Table 2, and are counted again in Table 3 as private facilities.

**TABLE 2** Staffing Requirements vs. Availability by Type of Public-Sector Facility in Tanzania, 2006

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Number</th>
<th>Health Professionals</th>
<th>Required</th>
<th>Available</th>
<th>Shortage</th>
<th>Shortage Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referral/Specialised Hospitals</td>
<td>8</td>
<td>Health Professionals</td>
<td>8,546</td>
<td>4,477</td>
<td>4,069</td>
<td>48%</td>
</tr>
<tr>
<td>Regional Hospitals</td>
<td>21</td>
<td>Health Professionals</td>
<td>7,266</td>
<td>2,481</td>
<td>4,785</td>
<td>66%</td>
</tr>
<tr>
<td>District Hospitals</td>
<td>95</td>
<td>Health Professionals</td>
<td>22,458</td>
<td>7,364</td>
<td>15,094</td>
<td>67%</td>
</tr>
<tr>
<td>Health Centres</td>
<td>331</td>
<td>Health Professionals</td>
<td>11,916</td>
<td>4,908</td>
<td>7,008</td>
<td>59%</td>
</tr>
<tr>
<td>Dispensaries</td>
<td>3,038</td>
<td>Health Professionals</td>
<td>30,380</td>
<td>9,384</td>
<td>20,996</td>
<td>69%</td>
</tr>
<tr>
<td>Training Institutions</td>
<td>72</td>
<td>Health Professionals</td>
<td>1,711</td>
<td>449</td>
<td>1,262</td>
<td>74%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,565</td>
<td></td>
<td>82,277</td>
<td>29,063</td>
<td>53,214</td>
<td>65%</td>
</tr>
</tbody>
</table>


**TABLE 3** Staffing Requirements vs. Availability by Type of Private-Sector Facility in Tanzania, 2006

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Number</th>
<th>Health Professionals</th>
<th>Required</th>
<th>Available</th>
<th>Shortage</th>
<th>Shortage Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals (referral, regional, and district)</td>
<td>132</td>
<td>Health Professionals</td>
<td>26,004</td>
<td>3,251</td>
<td>22,753</td>
<td>87.5%</td>
</tr>
<tr>
<td>Health Centres</td>
<td>150</td>
<td>Health Professionals</td>
<td>5,400</td>
<td>758</td>
<td>4,642</td>
<td>86%</td>
</tr>
<tr>
<td>Dispensaries</td>
<td>1,641</td>
<td>Health Professionals</td>
<td>11,467</td>
<td>1,842</td>
<td>9,645</td>
<td>84%</td>
</tr>
<tr>
<td>Training Institutions</td>
<td>36</td>
<td>Health Professionals</td>
<td>756</td>
<td>288</td>
<td>468</td>
<td>61.9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,959</td>
<td></td>
<td>43,647</td>
<td>6,139</td>
<td>37,508</td>
<td>85.9%</td>
</tr>
</tbody>
</table>

Currently, approximately 5,379 public and private health facilities operate in Tanzania. According to staffing levels proposed in 2006, these facilities required 125,924 health care workers, while the actual number of professional staff available was 35,202—a deficit of 90,722 (72 per cent) for public and private health facilities combined (MoHSW, 2006). Although this staffing shortage exists among all cadres, it is worst among clinicians, nurses, pharmaceutical technicians, laboratory technicians, radiographers, therapists, health officers, and health administrators (MoHSW, 2007a). As indicated in Tables 2 and 3, the deficit is greater in the private sector (85.9 per cent) than in the public sector (65 per cent), perhaps because of a perception that public-sector jobs are more secure and offer better benefits. The shortage is also more severe in rural areas, and is exacerbated by an expanding population; the HIV and AIDS pandemic; and the prevalence of malaria, TB, and other infectious diseases. The deficit threatens to become significantly larger in light of the MoHSW’s launch of a 10-year programme—Mpango wa Maendeleo wa Afya ya Msingi (MMAM), or Primary Health Services Development Programme—to expand and improve the provision of health services (curative, preventive, and rehabilitative) to the level of every village and every ward. The programme calls for the establishment and staffing of an additional 3,108 dispensaries, 2,074 health centres, and 19 district hospitals, which will require employment of an additional 80,659 professional health care workers by 2017 (MoHSW, 2007a).

Health Services Structure: Zanzibar

Health services in Zanzibar are organised into three levels (MoHSW, 2004): hospitals, primary health care centres (PHCCs), and primary health care units (PHCUs). Shortages of health care workers exist in Zanzibar, although they are not as severe as those in Tanzania mainland.

Hospitals

Zanzibar has one referral hospital and three district hospitals. These facilities provide both inpatient and outpatient services, and they are referral facilities for the first- and second-line PHCUs. Mnazi Mmoja is the main referral hospital in Zanzibar; it has a 400-bed capacity and 18 functional departments. Services provided include rehabilitation services, special consultation clinics, community health, counselling, complex MCH services, and coaching of students from Health Training Institutions (HTIs) during practical and field work.

Primary Health Care Centre

There are four PHCCs, also known as cottage hospitals. These facilities provide health services to a population of about 50,000. Services provided include inpatient and outpatient services, laboratory services, antenatal/intranatal/postnatal services, dental services, family planning, mental health services, and minor surgeries. The PHCCs act as referral centres for the PHCUs.

Primary Health Care Units

There are 118 PHCUs. These PHCUs have recently expanded, requiring more cadres of health care workers. There are two levels of PHCUs. The first-line PHCUs provide outpatient and community health services to a population ranging from 3,000 to 5,000. Each has two beds for observation. The second-line PHCUs are the same as the first-line PHCUs, except that they provide additional services (laboratory and dental).
Staffing Requirements vs. Availability

A situation analysis conducted in June 2003 by the MoHSW in Zanzibar demonstrated shortages among health care workers in all types of facilities (see Table 4). At the PHCU level, shortages of staff were most significant for the public health nurse B, public health assistant, clinical officer, pharmaceutical technician, and community health nurse cadres. At the PHCC level, cadres with significant shortages included medical specialist, assistant medical officer, medical recorder, paediatric nurse, public health nurse assistant, theatre nurse, physiotherapist, and pharmaceutical technician. At the district hospital level, significant staff shortages were found in the cadres of medical officer, medical specialist, assistant medical officer, laboratory technologist, nursing officer, public health nurse A, nurse/midwife, ophthalmic nurse, orthopaedic nurse, and pharmaceutical technician.

TABLE 4 Staffing Requirements vs. Availability by Type of Facility in Zanzibar, 2003

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Number</th>
<th>Required</th>
<th>Available</th>
<th>Shortage</th>
<th>Shortage Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Hospitals</td>
<td>3</td>
<td>566</td>
<td>494</td>
<td>72</td>
<td>13%</td>
</tr>
<tr>
<td>Primary Health Care Centres (PHCCs)</td>
<td>4</td>
<td>411</td>
<td>244</td>
<td>167</td>
<td>40%</td>
</tr>
<tr>
<td>Primary Health Care Units (PHCUs)</td>
<td>118</td>
<td>1,128</td>
<td>700</td>
<td>428</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>125</strong></td>
<td><strong>2,105</strong></td>
<td><strong>1,438</strong></td>
<td><strong>667</strong></td>
<td><strong>32%</strong></td>
</tr>
</tbody>
</table>


On the other hand, there were surpluses of some cadres of health care workers at each type of facility. At the PHCU level, for example, there was an excess of 388 health care workers in such positions as MCH assistant, health assistant, health orderly, general nurse, nurse midwife, and public health nurse A. At the PHCC level, there was a surplus of laboratory technicians, nursing officers, radiographers, and ophthalmic nurses. At the district hospital level, there were excess staff among hospital orderlies, laboratory technicians, laboratory assistants, clinical officers, and pharmaceutical auxiliaries.

Staffing for the Government Central Laboratory, the College of Health Sciences, and the MoHSW was also assessed (MoHSW, 2004). At the Government Central Laboratory, 30 posts, equivalent to 75 per cent of the required core medical posts, were vacant in 2003. Similarly, 34 posts, or 67 per cent of the required core academic staffing, were vacant at the College of Health Sciences, while 87 posts, representing 87 per cent of the required staffing, were vacant in the MoHSW.

Low remuneration for health care workers in Zanzibar—below minimum living standards—has a negative effect on staff performance and retention. Many Zanzibari health care workers leave the archipelago to work on the mainland.
Training of health care workers for different levels of the Tanzanian health care system started in the late 1930s. Opportunities exist for training all health cadres on the Tanzania mainland; fewer such opportunities exist in Zanzibar.

Training of health care workers in Tanzania falls into three categories: pre-service training, in-service training, and continuing education. These types of training are defined as follows:

- **Pre-service training**: Generally defined as instruction that takes place before a person begins a job. It involves training of students to become health care workers, using a formal training curriculum that leads to a professional qualification such as a certificate, diploma, or degree. Pre-service training is usually long term—from 1 to 6 years—and results in the training of new medical doctors, nurses, clinical officers, pharmacists, and other health care professionals.

- **In-service training**: Refers to the upgrading of health care workers’ professional qualifications through a residential or distance learning upgrade programme. It results in a certificate, diploma, or degree.

- **Continuing education or continuing professional development**: Refers to training of health care workers to update their knowledge and skills on specific topics, usually through short courses, workshops, and seminars.

Except for universities, which fall under the Ministry of Education, the training of health care workers in Tanzania is a function of the MoHSW Human Resources Development Department. The National Council for Technical Education (NACTE) oversees, registers, and accredits all technical training institutions in Tanzania. This body approves all health care worker programmes in the country and is an important component of the development of any national upgrade programme for these workers.

**Pre-Service and In-Service Training of Health Care Workers: Tanzania Mainland**

Seven universities that train health care workers fall under the oversight of the Ministry of Education. Qualifications offered at the university level include both bachelor’s and master’s degree programmes; medical officer training; and specialisations for nurses, assistant medical officers, and medical officers, including paediatrics, radiology, anaesthesia, dermatology, and optometry. HTIs offer diploma and certificate-level qualifications. Examples of HTIs include a Clinical Officer Training Centre (COTC) and an Assistant Medical Officer Training Centre (AMOTC), falling under the Allied Health Unit at the MoHSW, and a Nurse Training Centre (NTC), falling under Nursing Services. Table 5 shows a breakdown of the numbers of these training facilities. HTIs offer both pre-service training and in-service upgrading. In-service training takes the form of formal upgrade programmes in which health care workers earn higher qualifications (for example, upgrading from clinical assistant to clinical officer). Table 6 summarises the clinical and nursing cadres that are trained through HTIs.
### TABLE 5 Numbers of Universities and Health Training Institutions in Tanzania Mainland

<table>
<thead>
<tr>
<th>Training Facility</th>
<th>Public Sector</th>
<th>Faith-based Organisations</th>
<th>Private for-Profit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Allied Health Colleges</td>
<td>45</td>
<td>7</td>
<td>7</td>
<td>59</td>
</tr>
<tr>
<td>Nursing Colleges or Nurse Training Centres$^a$</td>
<td>27</td>
<td>2</td>
<td>28</td>
<td>57</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>73</strong></td>
<td><strong>12</strong></td>
<td><strong>38</strong></td>
<td><strong>123</strong></td>
</tr>
</tbody>
</table>


$^a$ The number of nursing colleges and nurse training centres was changing at the time this report was being written. The latest information from conversations with the MoHSW indicates that there are 69.

### TABLE 6 Training of Health Care Worker Cadres at Health Training Institutions

<table>
<thead>
<tr>
<th>Profession</th>
<th>Level of Education Needed</th>
<th>Length of Study to Attain Award</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal and Child Health Aide (MCHA)$^a$</td>
<td>Certificate of Primary Education—Standard 7</td>
<td>2 years</td>
<td>Certificate in Maternal and Child Health</td>
</tr>
<tr>
<td>Public Health Nurse B$^b$</td>
<td>Ordinary Certificate of Secondary Education—Form IV</td>
<td>2 years</td>
<td>Certificate in Public Health Nursing</td>
</tr>
<tr>
<td>Enrolled Nurse</td>
<td>Ordinary Certificate of Secondary Education—Form IV</td>
<td>2 years</td>
<td>Certificate in Nursing</td>
</tr>
<tr>
<td>Registered Nurse</td>
<td>Advanced Certificate of Secondary Education—Form VI or Upgrading from Enrolled Nurse—Form IV</td>
<td>3 years or 2 years to upgrade</td>
<td>Diploma in Nursing</td>
</tr>
<tr>
<td>Public Health Nurse A</td>
<td>Upgrading from Registered Nurse—Form VI</td>
<td>2 years</td>
<td>Diploma in Public Health Nursing</td>
</tr>
<tr>
<td>Clinical Assistant</td>
<td>Ordinary Certificate of Secondary Education—Form IV</td>
<td>2 years</td>
<td>Certificate in Clinical Medicine</td>
</tr>
<tr>
<td>Clinical Officer</td>
<td>Advanced Certificate of Secondary Education—Form VI or Upgrading from Clinical Assistant—Form IV</td>
<td>3 years or 2 years to upgrade</td>
<td>Diploma in Clinical Medicine</td>
</tr>
<tr>
<td>Assistant Medical Officer</td>
<td>Upgrading from Clinical Officer</td>
<td>2 years after receiving clinical officer diploma</td>
<td>Advanced Diploma in Clinical Medicine</td>
</tr>
</tbody>
</table>

$^a$The MoHSW no longer trains the MCHA cadre, which is being phased out with the upgrading of all MCHAs to enrolled nurses. $^b$This cadre is also being phased out.
Tanzania’s education system utilises a bilingual policy, which requires students to learn both Kiswahili and English. Kiswahili is the medium of instruction at the primary education level, while English is the medium of instruction for the secondary level and for all health care worker training. Because the level of education needed for some of the health care cadres is low (i.e., primary level or minimal secondary level), students often have a difficult time understanding classroom instruction and learning materials in English. Distance learning programmes surveyed for this study also used English as their official language of instruction.

Between 1995 and 2005, the HTIs were able to produce 23,474 health care workers, only 16 per cent of whom were employed in the public sector. In addition, the public sector has been losing an average of 300 staff per year. One possible reason is the lack of investment by the national government in health infrastructure, which includes staff housing, electricity, provision of water, basic communications, transport, and working tools and materials. These infrastructure challenges make it particularly difficult to recruit and retain staff in remote areas (MoHSW, 2007a). Other reasons cited by the MoHSW for the public-sector staff shortage include a lack of active recruitment and deployment after graduation from HTIs, poor remuneration, and a lack of incentives and retention schemes. Also cited was inadequate involvement of the private sector in human resource planning (MoHSW, 2006).

A study conducted by the National Institute for Medical Research (Mwisongo et al., 2007) in four rural districts of Tanzania found several human resource challenges in the health care system. First, the health care workforce comprises predominantly those who fail to complete primary school (63 per cent) and lower-level cadres (58 per cent). The cadres with lower- and intermediate-level training handle the majority of clinical responsibilities, including those that are usually reserved for higher-level cadres. The latter cadres perform mainly non-clinical activities, such as management and administration. Because of low salaries, health care workers divert from their clinical duties to engage in income-generating activities. Although higher salaries were perceived as the greatest motivator for worker retention, other motivators included satisfaction with one’s position, the opportunity for additional training, job security, and non-income benefits such as housing (Mwisongo et al., 2007).

Since 2005, enrolment in HTIs has increased from an average of 900 per year to 3,500 at the end of 2007. The number is expected to rise to meet the MMAM targets. One of the goals of MMAM is to increase enrolment in HTIs to 10,499 by 2017. Although largely unfunded at present, included in the strategy is expansion and upgrading of the current HTIs and construction of two additional AMOTCs (MoHSW, 2006, 2007a).

Continuing Education: Tanzania Mainland

Continuing education is designed to increase and improve the skills and knowledge of existing health care workers to enhance their performance and ensure the provision of quality services. Continuing education (or continuing professional development) takes the form of workshops or seminars, which are designed to update health care workers’ knowledge and skills regarding advanced in health care, including new diagnostic methods and treatments.

When health care workers undertake upgrading and continuing education, they expect better recognition, remuneration, and working conditions after completing the training; however, these expectations often are not met. Most in-service training and continuing education programmes are held outside health facilities, leaving the facilities understaffed for extended periods of time. The exception is in-service upgrade training conducted through the national Centre for Distance Education (CDE) in Morogoro.
Pre-Service Training: Zanzibar

The College of Health Sciences (CHS) is the only institution in Zanzibar that provides pre-service training in the health sector. Officially opened in November 1989 by the Zanzibar MoHSW, it offers seven programmes: General Nursing/Midwifery, Environmental Health, Medical Laboratory Science, Clinical Officer Training, Dental Therapy, Pharmaceutical Sciences, and Public Health Nursing. CHS can accommodate 200 students on campus and 80 more students living off campus. As of 2004, 783 students had graduated from the college since its inception. It is projected that by 2009, an additional 400 students will have graduated. This output will be insufficient to fill the skill gaps identified by the Zanzibar MoHSW. To address this demand, students from Zanzibar will be enrolled at HTIs in Tanzania mainland for undergraduate and post-graduate courses.

The Zanzibar MoHSW’s 5-year strategic plan notes that the CHS has a shortage of full-time tutors in some courses and that current full-time tutors are inadequately specialised. The CHS has not yet been accredited by the NACTE because of its teaching methods; transport problems; and inadequate resources, such as a lack of equipment during practical sessions in hospitals and other teaching venues. However, the CHS is receiving support from the African Development Bank, particularly for the construction of new buildings.

Continuing Education and In-Service Training: Zanzibar

The Zanzibar MoHSW’s Continuing Education Unit (CEU) was established in 1991 ‘to improve educational opportunities for health care workers in order to improve health care services they provide and contribute to personal and professional growth’. The main goal of the continuing education programme is to enable motivated health care workers to access training and information that can improve health care services and performance and create opportunities for upgrading professional roles or status. According to the 5-year strategic plan (MoHSW, 2004), the CEU will strengthen its distance learning programmes, establish a learning materials production unit, and expand the educational facilities of District Health Resource Centres. District Continuing Education Committees (CECs) manage District Health Resource Centres in ten districts that support the provision of training and information to health care workers. The CECs were established to assess the training needs of health care workers, as well as plan and implement training activities. The CECs are well established and have been functioning since 1992 in this capacity, but have received little funding. One CEU staff member interviewed suggested that increasing funding to the CECs could be a good mechanism for establishing distance learning opportunities for health care workers in the districts.

Present continuing education activities do not reach the majority of health care workers. This situation is exacerbated by the fact that 60 per cent of health care workers are fluent in Kiswahili only, fewer than 50 per cent have Form IV qualifications, and 100 per cent have received no orientation or training for their present job responsibilities (MoHSW Zanzibar, 2004). Establishing new approaches and programmes for self-learning, upgrading, and performance evaluation is a major focus of the Zanzibar MoHSW’s efforts to reform the CEU and the Human Resource Department to meet these challenges.

The 5-year strategic plan notes that on-the-job training is not well conducted by the government. The situation analysis study detailed in the plan revealed that staff training in the health care sector is provided on an ad hoc basis and leaves the majority of staff with minimal training opportunities. To address this problem, a Five-Year Training Plan that includes both short and long courses has been developed for PHCU, PHCC, district
hospitals, district health management teams, Mnazi Mmoja Referral Hospital, and the College of Health Sciences.

Registration of Health Care Workers

To practice medicine in Tanzania, medical officers and nurses must be registered. Doctors are registered through the Tanganyika Medical Council. Temporary registration is required for those who qualify for a medical degree from a reputable medical school before they start their internship. Those who successfully complete their internship and one year of practice as a qualified medical officer apply for permanent registration. No exams are required. Enrolled and registered nurses must register with the Tanzania Nurses and Midwives Council (TNMC). Nursing schools send the TNMC the names of successful graduates, who are then automatically registered and issued a certificate to practice. This certificate must be renewed every two years by the nurse. Currently, there is no continuing education requirement for renewal, but the TNMC is considering implementing this requirement. Clinical officers and clinical assistants receive their certificate of qualification after they complete their studies and are free to practice without registering.

Centre for Distance Education

The national CDE was established more than a decade ago in Morogoro in the Eastern Zone with the conceptualisation of two programmes: one to upgrade clinical assistants (formerly known as rural medical aides) to clinical officers, and the other to upgrade MCH aides to enrolled nurses. The CDE also collaborates with Aga Khan University on a third programme to upgrade enrolled nurses to registered nurses. The CDE’s role is to serve as a national centre to develop, coordinate, and implement distance learning programmes in Tanzania.

The objectives of the CDE and its programmes are to update health care workers’ knowledge, skills, and attitudes to improve their performance and ultimately the quality of care; upgrade health care workers to enable them to attain recognisable professional qualifications; and create more opportunities for training and career development for health care workers. Other roles of the CDE include the following:

- Soliciting resources to support distance learning activities
- Building capacity for distance learning tutors to provide support to distance learners
- Developing and updating print-based distance learning materials
- Designing, producing, and distributing distance learning course modules, tutor guides, learner guides, and other information and documents
- Updating the inventory of health care workers in need of distance learning
- Marketing and publicising distance learning programmes
- Planning, coordinating, and implementing distance learning activities
- Supervising distance learning activities in the zones and at study centres
- Monitoring student progress and maintaining learner records
- Performing quality assurance and monitoring and evaluation of distance learning activities
- Conducting tracer studies for graduated students

The MoHSW increased the CDE’s funding from an annual average of TSH 50,000,000 (USD 40,000) to TSH 283,000,000 (USD 235,000) for July 2008–June 2009 to support the scale-up of programmes for health care workers. Although the CDE implements its
programmes through the Zonal Health Resource Centres (ZHRCs) and the HTIs that serve as study centres, the meagre funding provided has historically been targeted to the CDE only. The 2009 budget calls for funding to be provided to the ZHRCs and study centres as well. As an ‘annual activity target’, MMAM calls for the CDE and eight ZHRCs to be strengthened and for distance learning capacity to be improved (MoHSW, 2007a).

Zonal Health Resource Centres

The MoHSW established the eight ZHRCs (formerly known as Zonal Training Centres) to facilitate the updating of health care workers’ skills and to monitor the HTIs in their respective catchment areas. The locations and catchment areas of the eight ZHRCs are shown in Figure 2. The roles of the ZHRCs are as follows (MoHSW, 2003; Public Health Consultants et al., 2005):

- Monitoring and evaluating the performance of the HTIs
- Determining the training needs of health care workers in their respective zones
- Planning training activities in coordination with the regions/districts
- Participating in the development and distribution of health care learning materials and curricula to districts and HTIs
- Coordinating workshops and training of trainers
- Coordinating supportive supervision and monitoring and evaluation activities at health care facilities
- Compiling quarterly reports on zonal training activities

Several challenges exist to the ability of the ZHRCs to carry out these roles. First, their roles are not well understood by national, regional, and district stakeholders. Second, inadequate funding from the MoHSW makes it difficult for them to achieve their mandate; although the ZHRCs do receive some support to fulfil their mission from donors and development partners such as the United States Agency for International Development (USAID), the Danish International Development Agency (DANIDA), and the German Society for Technical Cooperation (GTZ). Also, since each ZHRC is collocated with an HTI, its activities are intertwined with those of the HTI. The two share human and financial resources, leaving both under-resourced.

The ZHRCs also have a role in distance learning. Their responsibility is to work with the CDE to coordinate distance learning activities in their respective zones. In collaboration with the HTIs that serve as study centres, they are expected to receive and process applications; register distance learning students; support and monitor students; conduct face-to-face tutorials; and provide student assessment, counselling, and clinical supervision in practicum sites. In reality, the ZHRCs have not been provided the financial or human resources needed to carry out distance learning activities. Thus the CDE in Morogoro has the dual role of coordinating and carrying out all such activities, which has proven to be an obstacle to the nationwide implementation of distance learning.
3
Methods

This assessment was carried out during May–August 2008 and involved the use of various methods, including internet research, literature reviews, written questionnaires, telephone and e-mail surveys, a focus group, structured interviews, and on-site observations. In addition, members of the assessment team attended two conferences in Tanzania related to distance learning.

Many people collaborated to design, implement, and report on this assessment. The site visit teams consisted of representatives from the MoHSWs of Tanzania mainland and Zanzibar, the national CDE in Morogoro, HTIs, and I-TECH (see Table 7). Members were chosen for their varied expertise in distance learning for health care workers in Africa and/or their experience working at the national, zonal, and regional educational levels in the MoHSWs of both Tanzania mainland and Zanzibar. The I-TECH team members included the Digital Videoconferencing Technical Advisor from I-TECH Namibia; the Distance Learning Coordinator from I-TECH Headquarters in Seattle, USA; and the Zonal Health Resource Centre Programme Manager from I-TECH Tanzania. In addition to the site visit teams, several I-TECH staff were involved in both pre- and post-assessment activities, including site identification, initial site visits and interviews, data collection, data analysis, report writing, and report dissemination.

<table>
<thead>
<tr>
<th>Site Visit Team 1</th>
<th>Title</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anya Nartker</td>
<td>Distance Learning Lead, Training Development Team</td>
<td>I-TECH Seattle</td>
</tr>
<tr>
<td>Ramadhan Hamza Chande</td>
<td>Continuing Education Officer</td>
<td>Zanzibar Ministry of Health and Social Welfare (MoHSW)</td>
</tr>
<tr>
<td>Dr. Juma Luginia</td>
<td>Deputy Principal</td>
<td>Maswa Clinical Assistant Training Centre (CATC), MoHSW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Visit Team 2</th>
<th>Title</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin Kalowela</td>
<td>Zonal Health Resource Centre Programme Manager</td>
<td>I-TECH Tanzania</td>
</tr>
<tr>
<td>Jack Egan</td>
<td>Digital Videoconferencing Technical Advisor</td>
<td>I-TECH Namibia</td>
</tr>
<tr>
<td>Agnes Kinemo</td>
<td>Acting Assistant Director—Continuing Education</td>
<td>Human Resources Development Department, MoHSW</td>
</tr>
<tr>
<td>Dr. Daniel Kisimbo</td>
<td>Coordinator</td>
<td>Centre for Distance Education, Morogoro, MoHSW</td>
</tr>
</tbody>
</table>
ASSESSMENT DESIGN AND DATA COLLECTION

I-TECH staff conducted initial research in May and June 2008 to create an inventory of distance learning activities in Tanzania. Current programmes were identified, including university programmes that provide training in both health-related and non-health-related fields, MoHSW-sponsored distance learning activities, programmes conducted in collaboration with ZHRCs, and programmes sponsored by health-focused research centres and non-profit organisations. Initial contact was made with the programmes via e-mail and telephone. When feasible, pre-assessment visits were made to acquire background information on the programmes, to establish relationships with respondents prior to the actual assessment, and to schedule the assessment team visits. A total of 25 programmes in Tanzania were identified for the assessment team to visit. Note that at some of the sites visited, more than one programme was operating.

A thorough review was conducted to gather information on the distance learning activities across the I-TECH network, the University of Washington, and their partners in other countries. Data on distance learning activities were also collected from organisations working in countries with contexts similar to that of Tanzania. A programme-level survey was used to gather information from 13 organisations through e-mail and telephone interviews. The survey focused on each organisation’s background, programmatic challenges and strengths, technological constraints, and future vision. In addition, websites, programme reports, and published articles were reviewed for nine organisations conducting distance learning programmes. A total of 49 programmes were surveyed for this assessment (see Table 8). For a complete description of these programmes, see Appendix B.

SITE VISITS

The site visits took place during a 2-week period from 23 June to 4 July 2008. Two teams of three to four people visited 25 programmes in eight locations across Tanzania: Dar es Salaam, Arusha, Kigoma, Kilosa, Zanzibar, Morogoro, Mwanza, and Maswa. The main focus of the site visits was on observing and assessing distance learning activities. Before carrying out the site visits, the assessment teams were provided with a 1-day orientation on using each of the assessment tools. In addition, participating programmes were asked to make programme managers, tutors, students, and IT specialists available on the day of the assessment. During the site visits, the methods described below and summarised in Table 9 were used (see Appendix A for examples of each of the tools described).
<table>
<thead>
<tr>
<th>Institution/Programme</th>
<th>Description</th>
<th>Place</th>
</tr>
</thead>
</table>
| **Site Visits to the Centre for Distance Education (CDE), Clinical Assistant Training Centres (CATCs), Clinical Officer Training Centres (COTCs), Zonal Health Resource Centres (ZHRCs), and Zanzibar Ministry of Health and Social Welfare (MoHSW)** | **CDE, Morogoro**<sup>a</sup>  
National MoHSW centre for distance education for health care workers in Tanzania; various print-based, national upgrade programmes for health care workers, including current programmes (clinical assistant [CA] to clinical officer [CO], maternal and child health aid [MCHA] to enrolled nurse [EN], and EN to registered nurse [RN]) in collaboration with Aga Khan University (AKU); and planned programmes (CO to assistant medical officer [AMO], laboratory assistant to laboratory technician, health assistant to health officer, and pharmacy assistant to pharmacy technician) | Morogoro, Tanzania      |
|                                                                                       | **CDE, Morogoro: Collaboration with Cardiff University, UK, on a Sexually Transmitted Infection (STI) Module**<sup>b</sup>  
STI print-based module for planned 2-year national upgrade programme for CO to AMO; coordinated from CDE                                                                                           | Morogoro, Tanzania      |
|                                                                                       | **CDE, Morogoro: MCHA to EN Upgrade Programme**<sup>a</sup>  
Print-based, 2-year national upgrade programme; coordinated from CDE                                                                                                                                                                                                                                                  | Morogoro, Tanzania      |
|                                                                                       | **Maswa CATC: CA to CO Upgrade Programme**<sup>a</sup>  
Print-based, 3-year national upgrade programme; coordinated from CDE                                                                                                                                                                                                                                                      | Maswa, Tanzania         |
|                                                                                       | **Kigoma CATC: CA to CO Upgrade Programme**<sup>a</sup>  
Print-based, 3-year national upgrade programme; coordinated from CDE                                                                                                                                                                                                                                                  | Kigoma, Tanzania        |
|                                                                                       | **Kilosa COTC: CA to CO Upgrade Programme**<sup>a</sup>  
Print-based, 3-year national upgrade programme; coordinated from CDE                                                                                                                                                                                                                                                       | Kilosa, Tanzania        |
|                                                                                       | **Centre for Educational Development in Health Arusha (CEDHA)/Northern ZHRC: Diploma in District Health Management for Health Managers and Health Workers in the Districts**<sup>a</sup>  
Print-based, 3-year upgrade programme; coordinated from Northern ZHRC in four zones                                                                                                                                                                                                                           | Arusha, Tanzania        |
|                                                                                       | **CEDHA/Northern ZHRC: e-Collaboration Project using Global Campus 21 in collaboration with Capacity Building International (InWEnt), MoHSW, and ZHRCs**<sup>a</sup>  
Information and communication technology (ICT) activity aimed at creating a method for distance communication across ZHRCs and the MoHSW; coordinated from Northern ZHRC                                                                                                                                               | Arusha, Tanzania        |
|                                                                                       | **Eastern ZHRC, Morogoro**<sup>a</sup>  
No distance learning activities at this time; shares same infrastructure as CDE                                                                                                                                                                                                                                                                                  | Morogoro, Tanzania      |
<table>
<thead>
<tr>
<th><strong>Lake ZHRC, Mwanza</strong>&lt;sup&gt;a&lt;/sup&gt;</th>
<th>No distance learning activities at this time; collaborates in a limited capacity with the distance learning CA to CO programme in Maswa</th>
<th>Mwanza, Tanzania</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Western ZHRC, Kigoma</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>No distance learning activities at this time; collaborates in a limited capacity with the distance learning CA to CO programme in Kigoma</td>
<td>Zanzibar, Tanzania</td>
</tr>
<tr>
<td><strong>Zanzibar MoHSW Continuing Education Unit (CEU)</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Assists in coordinating AKU/CDE national EN to RN upgrade programme for Zanzibar students; developing infrastructure to enable additional ICT programmes</td>
<td>Zanzibar, Tanzania</td>
</tr>
</tbody>
</table>

**Site Visits and Reviews of Distance Learning Programmes in Tanzania**

<table>
<thead>
<tr>
<th><strong>AKU; Tanzania Institute for Higher Learning Advance Nursing Studies Programme in Dar es Salaam: EN to RN</strong>&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Print-based, 2-year upgrade programme; coordinated in collaboration with CDE out of AKU in Dar es Salaam; aimed at students in Dar es Salaam, Zanzibar, and Morogoro</th>
<th>Dar es Salaam, Tanzania</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AKU; Advance Nursing Studies Programme in Zanzibar: EN to RN</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Print-based, 2-year upgrade programme coordinated out of AKU in Dar es Salaam; additional coordination for Zanzibar students from the Zanzibar MoHSW CEU</td>
<td>Zanzibar, Tanzania</td>
</tr>
<tr>
<td><strong>AHADI Institute</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Serves as centralised coordinator of distance learning programmes from accredited educational institutions in Europe; aimed at youth in the Africa Great Lakes Region; programmes include law degree, social welfare diploma, teacher training degree, and economics degree</td>
<td>Kigoma, Tanzania</td>
</tr>
<tr>
<td><strong>Harvard University HOPE (HIV Online Provider Education) webcasts</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Live, bi-monthly internet-based presentations/discussions from faculty presenters on HIV-related topics, aimed mainly at health care providers at various Harvard University–funded project sites around the globe</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Ifakara Health Institute, Ifakara</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>No distance learning activities at this time, although strong technological infrastructure; utilises personal digital assistants (PDAs) in research programme</td>
<td>Ifakara, Tanzania</td>
</tr>
<tr>
<td><strong>International Institute for Communication and Development (IICD)</strong></td>
<td>Implementing various ICT projects in a wide range of fields throughout Tanzania; implementation of a District Health Management Information System (HMIS) in eight hospitals and four faith-based organisations (FBOs); conversion of conventional in-service and pre-service courses and workshop materials into e-learning courses for use by Muhimbili University of Health and Allied Sciences (MUHAS)</td>
<td>Dar es Salaam, Tanzania</td>
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</tr>
<tr>
<td><strong>InWEnt, Global Campus 21</strong></td>
<td>InWEnt provides various e-learning courses in the areas of health, education, business, and humanitarian studies through a programme called Global Campus 21; participants include MoHSW, Ministry of Education (MOE), and MUHAS personnel and students; utilised by Northern ZHRC for staff and students</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>MUHAS</strong></td>
<td>Various electronic resources available to students; internet portal providing health information to and from the districts, regions, health experts, and postgraduate students</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Open University of Tanzania (OUT)</strong></td>
<td>Several print- and internet-based distance learning degree programmes in science, education, business management, and law; implemented through 25 Regional Centres and 69 Study Centres</td>
<td>Dar es Salaam, Tanzania, and other areas</td>
</tr>
<tr>
<td><strong>Phones for Health</strong></td>
<td>Mobile phones used to transmit data to and from health care workers, mainly for disease reporting and surveillance</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Tanzania Education and Research Network (TERNET)</strong></td>
<td>Network of higher-learning and research institutions connected through high-speed internet using ICT resources to enhance research and education in Tanzania and facilitate e-learning activities</td>
<td>Throughout Tanzania</td>
</tr>
<tr>
<td><strong>Tanzania Global Development Learning Centre (TGDLC)</strong></td>
<td>Non-profit organisation that offers high-end videoconferencing using a wideband satellite system linked to more than 120 global conferencing centres; e-learning courses and a computer lab with Internet capabilities and CD-ROM, print, and video services are available for fees; for use by public and private sectors</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td>Conference/Visit</td>
<td>Description</td>
<td>Location</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>World Health Organisation (WHO): Integrated Management of Childhood Illness Computerised Adaptation and Training Tool (ICATT): Dar es Salaam</strong></td>
<td>E-learning software application developed as an alternative training approach to support implementation of the WHO/UNICEF strategy on the Integrated Management of Childhood Illness (IMCI); includes clinical guidelines, chart books/algorithms, and resources</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Conferences Attended in Tanzania</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second National Telemedicine Conference</td>
<td>Eighteen attendees convened to capture lessons learned, discuss overcoming challenges and barriers, identify practicing organisations and institutions, and provide input for the development of a national telemedicine policy</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td>mHealth Workshop: Mobile Phone Applications for Public Health</td>
<td>Fifty participants gathered to present and discuss application and implementation of mHealth, including use of mobile devices for outreach, telemedicine, data gathering, and clinical care</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Visits to Tanzania Information Technology (IT)/Distance Learning Technology Organisations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIM Consultants</td>
<td>IT services company providing comprehensive IT support and services to small and medium-sized businesses, individuals, and governmental and non-governmental organisations</td>
<td>Dar es Salaam and Arusha regions of Tanzania</td>
</tr>
<tr>
<td>MoHSW IT Unit</td>
<td>Provides IT support services to other units of the MoHSW; responsible for installation of computers and very small aperture terminals (VSAT) at all ZHRCs; provides user support, develops custom software (if needed), maintains MoHSW website, and provides ICT inputs</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td>Soft-Tech</td>
<td>One of the largest IT and telecommunications service providers in Tanzania; offers IT training, telecommunications services (including digital videoconferencing and satellite), and banking and ATM services</td>
<td>Dar es Salaam, Tanzania</td>
</tr>
<tr>
<td><strong>Review of Distance Learning Programmes with Contexts Similar to That of Tanzania</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa Teledermatology Project</td>
<td>Uses web-based telemedicine technology to provide medical services at a distance by connecting several medical centres to enable exchange of expert dermatology information; aimed at local physicians, dermatologists, and health care workers in hospitals and clinics throughout Africa</td>
<td>Uganda, Botswana, Malawi, Swaziland, Burkina Faso, and Lesotho</td>
</tr>
<tr>
<td>Organisation</td>
<td>Programme Description</td>
<td>Location</td>
</tr>
<tr>
<td>--------------</td>
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<td>----------</td>
</tr>
<tr>
<td>African Medical and Research Foundation (AMREF)</td>
<td>Print-based and e-learning upgrade programmes for nurses</td>
<td>Based in Kenya with offices in Uganda, Ethiopia, South Africa, Sudan, and Tanzania</td>
</tr>
<tr>
<td>Caribbean Health Leadership Institute (CHLI) and University of West Indies (UWI)</td>
<td>Year-long e-learning course to train health professionals in leadership</td>
<td>Jamaica</td>
</tr>
<tr>
<td>HIV [e]Ducation</td>
<td>Three-month-long e-learning programme utilising memory sticks for training health care workers in HIV</td>
<td>Caribbean, India, Mozambique, Netherlands, Uganda, Kenya, Tanzania, Malawi, and Indonesia</td>
</tr>
<tr>
<td>JHPIEGO, Distance Learning Course for Antiretroviral Therapy (ART) Providers</td>
<td>Ten-week distance learning course on ART and management of opportunistic infections for HIV and AIDS for ART care and treatment providers, including physicians, COs, nurses, pharmacists, lab technicians, and environmental health technologists</td>
<td>Zambia</td>
</tr>
<tr>
<td>Johns Hopkins Centre for Clinical Global Health Education (CCGHE) and Global Health eLearning Centre</td>
<td>Live infectious disease grand rounds webcasts and videoconferencing; HIV clinical care discussions; online resource for clinicians; e-learning courses; master in public health distance learning degree programme</td>
<td>US-based/global (India, Ethiopia, Tanzania, Zambia, Democratic Republic of the Congo, and Uganda)</td>
</tr>
<tr>
<td>Learning for International Non-Governmental Organisations (LINGOs)</td>
<td>Members have access to e-learning courses, e-learning software, and language training</td>
<td>US-based/global</td>
</tr>
<tr>
<td>Mildmay Centre</td>
<td>In conjunction with Manchester University in the UK, offers a modular diploma and degree in HIV programme management and is part of a bachelor of science degree programme titled ‘Health Systems Approach to HIV and AIDS Care and Management’</td>
<td>Uganda, Kenya</td>
</tr>
<tr>
<td>Mindset</td>
<td>Distance learning is offered to health care workers and the general public through satellite broadcast, a website, and videos</td>
<td>South Africa</td>
</tr>
<tr>
<td>Réseau en Afrique Francophone pour la Télémédecine (RAFT)</td>
<td>Webcasting sessions for clinicians and hospital administrators in 15 West African countries; internet-based telemedicine/teleconsultations</td>
<td>West Africa region</td>
</tr>
<tr>
<td>University of Swaziland Distance Learning</td>
<td>Various web-based distance learning courses and bachelor degrees</td>
<td>Swaziland</td>
</tr>
<tr>
<td>Programme</td>
<td>Description</td>
<td>Location</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Videoconferencing at three South African Universities (Stellenbosch, University of Pretoria, and the University of Freestate)</td>
<td>Videoconferencing sessions presented radiology topics</td>
<td>South Africa</td>
</tr>
<tr>
<td><strong>Review of Distance Learning Programmes in the I-TECH Network</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-TECH HIV/AIDS Clinical Seminar Series*b</td>
<td>Bi-monthly web-based distance learning series aimed at health care workers treating HIV and AIDS in Africa, the Caribbean, and India; HIV and AIDS experts present on a variety of advanced care, comprehensive management, and treatment topics via live sessions across several countries</td>
<td>Seattle; Africa region, Caribbean region, India</td>
</tr>
<tr>
<td>I-TECH Botswana Monitoring and Evaluation Officer Mentoring Programme (District Level)b</td>
<td>Three-year programme that combines national training, regional training, on-site mentoring, and self-study exercises to be completed by mail</td>
<td>Botswana</td>
</tr>
<tr>
<td>I-TECH Global Staff In-Service Series*b</td>
<td>Live, web-based sessions on a variety of professional development topics aimed at staff within the I-TECH network</td>
<td>Seattle and I-TECH global network</td>
</tr>
<tr>
<td>I-TECH India: Clinical Consultation Warmline*b</td>
<td>Phone line devoted to answering clinicians’ questions concerning HIV and ART, post-exposure prophylaxis (PEP), and perinatal care to support clinicians across India in providing quality HIV and AIDS treatment and care</td>
<td>India</td>
</tr>
<tr>
<td>I-TECH India: HIV Listserv*b</td>
<td>Monthly listserv updates on HIV and AIDS for clinicians</td>
<td>India</td>
</tr>
<tr>
<td>I-TECH Namibia Digital Videoconferencing (DVC) Project*b</td>
<td>Use of videoconferencing for meetings, demonstrations, film forums, and presentations aimed at Ministry of Health clinicians and staff</td>
<td>Namibia</td>
</tr>
<tr>
<td>University of California, San Diego’s (UCSD) Clinical Case Teleconference with I-TECH South Africa*b</td>
<td>Live, on-line, weekly teleconference hosted by UCSD’s I-TECH mentors; review of patient cases related to HIV, along with open discussion with clinical mentors from South Africa, Peru, Mexico, and the US</td>
<td>Eastern Cape, South Africa</td>
</tr>
</tbody>
</table>

*aProgrammes, sites, or conferences that assessment teams observed, attended, or interviewed in person.
bProgrammes that were interviewed via phone or e-mail questionnaire.
cProgrammes for which websites, programme reports, and published articles were reviewed.
### TABLE 9  Site Assessment Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Target Group</th>
<th>Number of Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured interviews</td>
<td>Programme managers</td>
<td>22</td>
</tr>
<tr>
<td>Structured interviews (6)</td>
<td>Distance learning tutors</td>
<td>8</td>
</tr>
<tr>
<td>Questionnaires (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured interviews (20)</td>
<td>Distance learning students</td>
<td>34</td>
</tr>
<tr>
<td>Questionnaires (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured interviews</td>
<td>IT specialists</td>
<td>9*</td>
</tr>
</tbody>
</table>

*This number includes both IT support staff at distance learning programmes visited and IT specialists at internet service provider firms visited.

### Interviews with Programme Managers, Tutors, Students, and Information Technology (IT) Specialists Supporting the Programme

To obtain a diverse view of the programmes’ challenges and successes, programme managers, tutors, students, and IT specialists were interviewed. Structured interviews were conducted with distance learning programme managers to capture information on the achievements and challenges of the programme, future plans, and how the programme addresses health care worker shortages in Tanzania. Tutors and students were interviewed to obtain their insights on student/tutor interactions, practicum components, curriculum and course materials, and how students planned to apply their new knowledge and skills after completing the programme. Interviews with IT specialists were conducted to gain an understanding of the technological context and to assess the feasibility of implementing various distance learning technologies and digital videoconferencing in Tanzania. Specialists were interviewed about internet and telecommunications connectivity, electrical power, and technology access issues.

### Questionnaires with Tutors and Students

Structured, individual interviews were the primary means used to collect information from respondents during the site visits. In some cases, however, questionnaires were distributed on site to tutors and students because of time and/or resource constraints. The questionnaires posed identical questions in the same order. Although it would have been preferable to conduct interviews with every respondent, the questionnaires allowed the assessment teams to gather similar information from a greater number of individuals.

### Observations of Distance Learning Activities, Including e-learning Programmes, Face-to-Face Tutorials, and Live Synchronous Sessions

To understand the constraints and successes of a technology or component utilised in a distance learning programme, an observation form was created for use during observation of live sessions. Teams were able to observe one face-to-face session and one internet-based synchronous session. Constraints such as timing and scheduling prevented the teams from attending additional live sessions.
Collection of Distance Learning Curricula and Course Materials, as well as Programme Reports, Evaluations, and Marketing Materials Where Possible

Teams attempted to gather supporting materials and documents that would provide information on the quality of the learning materials used, how the programme was logistically organised, and how it was marketed to students/employers. Unfortunately, these materials were scarce, and in many cases this method could not be used.

ADDITIONAL DATA COLLECTED

Using a variety of methods, data were collected from additional sources in Tanzania to supplement the information gathered during the on-site visits (see Table 10). These data not only provided a broader perspective on distance learning activities, but also enhanced the validity of the site visit findings. Target groups included distance learning preceptors, health care decision makers, health care workers, and HIV and AIDS care and treatment partners.

<table>
<thead>
<tr>
<th>Method</th>
<th>Target Group</th>
<th>Number of Informants/Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured interviews</td>
<td>Distance learning preceptors</td>
<td>4</td>
</tr>
<tr>
<td>Structured interviews</td>
<td>Health decision makers (MoHSW)</td>
<td>2</td>
</tr>
<tr>
<td>Mail-in surveys</td>
<td>Health care workers</td>
<td>46</td>
</tr>
<tr>
<td>Focus group discussion (1)</td>
<td>Care and treatment partners (training organisations)</td>
<td>7 (1 from each organisation)</td>
</tr>
</tbody>
</table>

Distance learning preceptors were targeted to capture their perspectives on challenges and achievements of the practical or clinical components of distance learning programmes. All of the preceptors were interviewed by I-TECH Tanzania staff using a structured interview guide. To gain insight into the training needs of health care workers in Tanzania and to determine whether distance learning could meet those needs, health decision makers in different branches of the MoHSW were contacted. These individuals were interviewed by I-TECH Tanzania staff using a structured interview guide.

Health care workers were also targeted to learn about their training needs, as well as their interest in and level of experience with distance learning programmes. Surveys used for this purpose included both open-ended and closed questions and were distributed to a convenience sample of respondents. Health care workers filled out the surveys and returned them to I-TECH by post.

Finally, a focus group discussion was held with seven participants from key HIV and AIDS care and treatment training organisations in Tanzania. The organisations represented included Family Health International, University Research Company, Elizabeth Glaser Paediatric AIDS Foundation, International Center for AIDS Care and Treatment Programs at Columbia University (ICAP), Program for Appropriate Technology in Health (PATH), the Clinton Foundation, and Muhimbili University of Health and Allied Sciences (MUHAS)—Harvard. The discussion was conducted to obtain additional viewpoints on the training needs of health care workers in Tanzania and to determine whether partners believed distance learning could help meet those needs. Information was also solicited on the participants’
experiences with distance learning. A focus group discussion guide was created, and the discussion was facilitated by an I-TECH Tanzania staff member.

DATA ANALYSIS

The data collected were analyzed by I-TECH staff. Thematic coding was used for the qualitative data and simple tabulation for the quantitative data.
Part II
Results
Results

This part of the report presents the results of the distance learning assessment, which form the basis for the recommendations made in Part III. The results are organised as follows:

- Achievements and benefits of Tanzania’s distance learning programmes (Chapter 4)
- Challenges and constraints (Chapter 5)
- Issues of technological feasibility (Chapter 6)
- The capacity of Tanzania’s Zonal Health Resource Centres to conduct distance learning programmes (Chapter 7)
- Demand for distance learning for health care workers in Tanzania and potential cadres to be trained (Chapter 8)
- Lessons learned about good standard practices related to distance learning (Chapter 9)
4

Achievements and Benefits

The research, interviews, and site visits described in Chapter 3 revealed many achievements and benefits of distance learning programmes for health care workers in Tanzania that can serve as the foundation for programme improvements and effective scale-up of distance learning across the country. The most significant achievements include establishment of the national CDE for development and implementation of health care worker training programmes, recent growth in print-based distance learning programmes to upgrade health care workers, recognition by the MoHSW of distance learning as an effective method for training and addressing shortages of health care workers, enthusiasm of current and potential distance learning students about its benefits, and initiation of the use of more technologically advanced distance learning platforms.

1. **The MoHSW’s establishment of the national CDE in Morogoro has created the foundation for a national capacity to implement distance learning programmes for health care workers in Tanzania.**

Formation of the CDE has been one of the most significant steps in establishing a national distance learning strategy for training health care workers in Tanzania and creating a sustainable foundation for the development of a national capacity to implement distance learning programmes. The objectives of the CDE and its programmes are to 1) update health care workers’ knowledge, skills, and attitudes; 2) improve their performance and thereby the quality of care; 3) upgrade them so they can attain recognised professional qualifications; and 4) create more opportunities for their training and career development.

The national CDE was established by the MoHSW more than a decade ago in Morogoro. Two programmes were developed: one to upgrade clinical assistants to clinical officers, and the other to upgrade maternal and child health aides to enrolled nurses. An additional programme to upgrade enrolled nurses to registered nurses was started in 2007 in collaboration with Aga Khan University.

The clinical assistant to clinical officer programme was the first and is the most established of the CDE programmes. Initially, it was piloted in five zones: Eastern, Southern, Lake, Northern, and Southern Highlands. For the first 3 years, it was funded by Irish Aid support; currently it is funded by the MoHSW. In 2002, an evaluation was conducted to determine the feasibility of scaling up the programme (MoHSW, 2007b). The evaluation revealed that the programme was cost-effective in updating and upgrading health care workers. The programme then became an integral part of the Continuing Education Unit under the Human Resource Development Department of the MoHSW, and planning for scale-up began.
The national CDE has made substantial achievements:

- Establishment of several study centres to support distance learners—COTCs in Kilosa, Musoma, Mtwara, Masasi, Mvumi, Mafinga, and Machame; CATCs in Maswa and Kigoma; and NTCs in Morogoro and Bagamoyo—with plans for expansion to other sites, such as Ifakara AMOTC (Study centres are HTIs selected by the CDE to conduct face-to-face sessions with distance learners, provide them a place to meet and access resources, and implement final exams.)
- Training of 59 distance learning tutors (11 trained abroad and 48 locally)
- Collaboration with development partners (Aga Khan University and Cardiff University in the UK) to develop materials and implement programmes
- Development of printed distance learning modules by a working group of local tutors

In 2000, the CDE piloted its first distance learning programme to upgrade clinical assistants to clinical officers in a period of 3 years. This remains the largest and most established CDE programme, with 702 students currently enrolled. To date, 97 clinical assistants have graduated to become clinical officers (32 from Maswa, 36 from Kilosa, 17 from Masasi/Mtwara, 3 from Machame, 1 from Mafinga, 2 from Kigoma, 5 from Musoma, 1 from Lindi). In January 2007, the maternal and child health assistant to enrolled nurse programme was initiated by the CDE as a 2-year programme; it currently has 84 students. In January 2007, the enrolled nurse to registered nurse programme, also a 2-year programme, was begun in collaboration with Aga Khan University and offered to students in Morogoro, Zanzibar, and Dar es Salaam. Currently 104 students are enrolled in this programme, which is managed and administered by Aga Khan University.

The CDE has also begun working with other countries to share experiences and lessons learned in managing national distance learning programmes for health care workers. Recently, the CDE hosted a Ugandan team and shared information about its upgrade programmes. The head of the CDE also visited the Ugandan national programme when the CDE was first established. Exchanges have occurred as well with the UK, Germany, and Wales/UNESCO.

*First cohort of graduates from the national clinical assistant to clinical officer upgrade programme, from Kilosa, Clinical Officer Training Centre*
2. **Political will exists within the MoHSW to support distance learning programmes to train health care workers in Tanzania.**

Distance learning is a key strategy of the MoHSW’s Continuing Education Unit. The CDE works in conjunction with the MoHSW Human Resource Development Department (HRD) to scale up the use of distance learning for updating and upgrading health care workers in Tanzania. The MoHSW recognises distance learning as a cost-effective means of capacity building at the national level to meet the human resource challenges identified in the national report on MMAM. MMAM calls for a massive scale-up of health care services in Tanzania so that each ward will have a health centre and each village a dispensary. MMAM specifically identifies the use of distance learning to train additional health care workers as a way of attaining this goal.

The MoHSW has increased the budget for expanding and implementing distance learning programmes for health care workers—from an annual average of TSH 50,000,000 (USD 40,000) to a budget of TSH 283,000,000 (USD 235,000) for July 2008–June 2009—although at the time of this assessment, the funding had not yet been disbursed.

3. **The use of distance learning programmes for health care workers in Tanzania has been growing.**

The CDE would like to assume ownership of the enrolled nurse to registered nurse programme currently run by Aga Khan University, adapt the curriculum to accord with the Tanzania registered nurse training, and expand the programme to the entire country. Aga Khan University would continue to conduct its version of the programme separately. In addition, the CDE is planning three new upgrade programmes for the 2008–2009 fiscal year:

- Clinical officer to assistant medical officer programme, which will be piloted in the Morogoro region with Ifakara AMOTC
- Laboratory assistant to laboratory technician programme
- Health assistant to health officer programme

The CDE also wanted to begin a pharmaceutical assistant to pharmaceutical technician programme, but lacked funding for the 2008–2009 fiscal year.

The CDE has partnered with the Medical School at Cardiff University, UK, to design and develop modules on syndromic approaches to counselling patients with sexually transmitted infections (STIs) and HIV and AIDS. These are intended to be the first of a number of modules to be launched in 2008 for the clinical officer to assistant medical officer upgrade programme. Modules for the laboratory technician and health officer upgrade programmes are also in the planning stages.

In 2006, the Centre for Educational Development in Health Arusha (CEDHA) began a 3-year distance learning diploma programme in district health management for health managers and health care workers in the districts. The programme is currently in four zones (Northern, Southern Highlands, Southern, and Eastern), with a total of 113 participants.

Non-governmental distance learning programmes include AHADI’s diploma programme in social welfare. This programme, started in Kigoma in 1993, targets youth and refugees in the African Great Lakes Region (Burundi, Rwanda, Tanzania, and Democratic Republic of Congo). Current enrolment for all of AHADI’s programmes (which include

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1 Ahadi is a Swahili word meaning promise or commitment.
secondary and post-secondary educational programmes) totals 416, a decline from 2002 when enrolment totalled 798 (all refugees).

In 2005, the African Medical and Research Foundation (AMREF), a Kenya-based organisation with offices in other East African countries that is renowned for its distance learning offerings for health care workers, piloted a country-wide e-learning programme to upgrade enrolled nurses to registered nurses in Kenya. AMREF may implement its model in Tanzania. The programme is a blend of face-to-face sessions and self-paced computer-based material. Students are also required to complete 42 weeks of clinical experience.

4. Technologically advanced platforms for distance learning are being planned and implemented in Tanzania.

Although the majority of sites visited for this assessment use print-based media, programmes using computer-based and internet-based technologies are being implemented. In addition, many public health programmes are using mobile device-based technologies, such as cell phones and PDAs, for research, reporting, and clinical care. These technologies may have potential for use in distance learning programmes.

Despite the constraints of low bandwidth and unreliable internet connectivity (see Chapter 5), three distance learning programmes in Tanzania rely primarily on the internet (the I-TECH HIV/AIDS Clinical Seminar Series, the Harvard University HIV Online Provider Education [HOPE] Project, and Global Campus 21), and one relies primarily on computers (the World Health Organisation’s [WHO’s] Integrated Management of Childhood Illness [IMCI] Computerised Adaptation and Training Tool [ICATT], discussed below). Some print-based upgrade programmes may also make some use of the internet. In addition, telemedicine programmes utilise internet-based software. Some of these programmes are discussed below; a full description is provided in Appendix B.

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**I-TECH HIV/AIDS Clinical Seminar Series.** Adobe Connect Pro Live is the virtual classroom software used in this web-based seminar series.
Internet-based webinars (live online seminars) are conducted on HIV and AIDS topics by Harvard University’s HOPE project and I-TECH’s HIV/AIDS Clinical Seminar Series. Both use a web conferencing/e-learning platform to broadcast across multiple global sites, including Tanzania, and both target health care workers treating patients with HIV and AIDS in resource-limited countries. Harvard University uses a platform called Centra 7, while I-TECH uses Adobe Connect Pro Live. HIV and AIDS experts make presentations on cutting-edge topics using lectures with PowerPoint slides, and participants ask questions and make comments through a chat box, or in some cases by voice. Sessions are recorded and are archived for later viewing.

The enrolled nurse to registered nurse upgrade programme run by Aga Khan University has begun to use of web conferencing/e-learning software called Elluminate, produced by a Canadian company. Tutors in Dar es Salaam make live presentations to students in Dar es Salaam, while students in Zanzibar and Morogoro log on to an Elluminate virtual classroom platform to hear the tutor and view the slides presented.

The Tanzania Global Development Learning Centre is a non-profit organisation that offers high-end videoconferencing using a wideband satellite system that is linked to more than 120 global conferencing centres. It also has e-learning courses available, as well as a computer lab with internet capabilities and CD-ROM, print, and video services. Its conference room can be rented by organisations in the public or private sector. The cost of a videoconferencing room and online service is a USD 205 connection fee plus USD 200 per hour. Most recently, the Tanzania Heart Institute used the conferencing system to conduct a telemedicine session involving a live heart operation with the African Heart Institute.

Assessment team members participated in the Second National Telemedicine Conference in Tanzania on 2 July 2008. Various FBOs, such as Evangelical Lutheran Church in Tanzania, presented on telemedicine programmes in their hospitals. Clinicians are trained in computer skills and in use of a case consultation software programme called iPath that allows
clinicians to upload images and patient histories to a website and receive answers to their questions within 24 hours. Some hospitals also have teleradiology programmes that allow radiologists to scan an x-ray and send it to Germany for a second opinion.

WHO is currently adapting the ICATT software to the Tanzanian context. ICATT is a computer-based programme for in-service training in IMCI for health care workers. It includes interactive self-study exercises and quizzes, libraries, tools, and links. The programme is aimed at training health care workers at various levels in IMCI, as well as assisting with the implementation of IMCI. The interface is flexible so it can be used for classroom teaching, self-study, or distance learning. The software took 2 years to develop and was created as a more efficient, flexible alternative to classroom-based training. WHO plans to pilot the software with potential partners including the Ifakara Health Institute, Muhimbili University, and the Kilosa Clinical Officer Training Centre. The programme will be conducted as continuing education in computer labs at partnering HTIs. The MoHSW will own the programme once it has been adapted and will be able to make further changes as needed. In this way, the product can remain more sustainable. However, managers of the WHO programme in Tanzania reported that they struggled to find local staff with the instructional design skills, content knowledge, and experience working with computer-based training to adapt the training to the Tanzanian context.

CEDHA is beginning to design management/supervision cases for its district health managers programme using software that allows participants to select answers and receive feedback on those answers in self-study cases. The programme plans to include the cases either on its website or on CD-ROMs distributed to students.

At the mHealth Workshop: Mobile Phone Applications for Public Health, held in Dar es Salaam in August 2008, many organisations presented on how they are using mobile technologies for collecting data (i.e., baseline household survey health data, data from home visits, HIV care and treatment data from clinic sites, mosquito net and family planning monitoring and reporting, and diagnostic test data). One application that could be transferable is the use of mobile devices to store checklists for patient assessment and medical protocols for screening and dosing of anti-retroviral (ARV) drugs. D-Tree International is piloting an IMCI protocol project in Ifakara in which IMCI protocols are loaded into PDAs to help classify and treat common childhood illnesses. With CDC/Tanzania and PEPFAR funding, the organisation is also piloting a project that uses PDAs designed for nurses at a care and treatment clinic (CTC) to assess whether HIV-positive patients on anti-retroviral therapy (ART) need to see a clinician or can simply receive care, counselling, and a refill from the CTC nurse.

Phones for Health is a programme funded by CDC–PEPFAR that uses mobile phones to support the scale-up of HIV, AIDS, TB, and malaria programmes. The mobile phones allow health care workers in the field to use a standard Motorola handset equipped with a downloadable application to enter health data. Once entered, the data are transferred from the phone to a central database. They are then mapped and analyzed by the system and immediately made available to health authorities at multiple levels via the internet. Mobile technologies have potential implications for the training of health care workers. A programme manager for the International Institute for Communication and Development (IICD) mentioned that some organisations are experimenting with the use of mobile phone technology to send tests and assignments to students and allow them to enter answers and return them via short message service (SMS).

InWEnt’s Global Campus 21 is a web-based learning platform. Participants from a variety of countries use its online e-learning courses and virtual workrooms to learn together.
discuss and share experiences, and collaborate on projects. The site can be accessed at any
time and does not require special software. The interface is available in five languages
(German, English, Spanish, French, and Russian), with content in many more languages.
InWEnt intends Global Campus 21 to be used by development cooperation institutions and
by private businesses working in international human resources and organisational
development. Global Campus 21 is financed by a grant from the German Federal Ministry of
Economic Cooperation and Development and by orders of its customers.
InWEnt’s office in Dar es Salaam is the headquarters for implementing the Global
Campus 21 programme in the East Africa region. The programme has short certificate
courses lasting approximately 3 months on HIV and AIDS, health systems management,
conflict management, sustainability management, and regional economic development.
Participants are selected from five target countries—Kenya, Cameroon, Tanzania, Malawi,
and Rwanda. The programme is delivered from Germany and uses several modalities: face-
to-face meetings; e-learning materials downloaded from the internet; and live web-based
sessions for instruction, discussion, and group work. The courses are used mainly for
continuing education.

CEDHA attempted to launch an e-collaboration project aimed at ZHRCs across Tanzania.
The project involved use of the Global Campus 21 platform. CEDHA made use mainly of the
online working group feature, which includes chat boards on various topics and features that
allow documents and images to be uploaded. Small virtual groups were formed around
various topics. The ZHRCs were highly enthusiastic about this programme, and although it
failed to be implemented across the country, some staff members in various ZHRCs still use
it to collaborate on tasks and share experiences and best practices related to such topics as
curriculum development for health care worker training and supervision/management
responsibilities.

5. **There is high demand for distance learning among health care workers and the
government of Tanzania.**

High demand for health care worker upgrade programmes in Tanzania is articulated by
the MoHSW in the MMAM report (MoHSW, 2007a). Health care workers are required by
the MoHSW to upgrade their skills, yet opportunities and programmes for doing so are
limited. Thus, the existing distance learning upgrade programmes provide an important
means of increasing the skills and capacity of the Tanzanian health care workforce.

One distance learning programme tutor noted that the demand is especially high for
enrolled nurse to registered nurse programmes as nurses are the largest cadre to be upgraded
in Tanzania. Many programme managers, tutors, and students commented that distance
learning allows HTIs to offer more students the opportunity to apply because fewer resources
are needed than for a residential programme. Several students noted that they chose distance
learning programmes specifically because such programmes were ‘easier to get accepted
into’. This is likely due to the limited number of slots available in the resident health care
worker training programmes, with more people applying than there is space available.
Surveyed health care workers expressed their interest in enrolling in a distance learning
course for similar reasons. As one respondent explained, ‘Distance learning will meet my
training needs as it is too difficult to get a chance for training through other [resident]
programmes.’

Another commonly stated reason for health care workers’ widespread interest in distance
learning is that not enough institutes offer pre-service and in-service training for health care
workers. A health care worker stated, ‘[I would apply] exactly and immediately. I would
apply because the chance of training is too limited. Training institutions are too scattered even if you have qualifications to join.’

In all of the distance learning upgrade programmes assessed, more students apply than can be accepted because of resource and infrastructure limitations. For example, one programme had 120 qualified applicants but could accept only 40.

Distance learning programme managers commented on the potential broad reach of such programmes: ‘If you have a quality programme, you can reach a large number of people to make a difference.’ A preceptor for a distance learning enrolled nurse upgrade programme stated that ‘there is a great demand for upgrading’, and as a result, the programme continues to see an increase in student enrolment. In addition, all of the preceptors who were interviewed agreed that there is a need to expand or scale up current distance learning activities to meet the training demands of health care workers.

6. The flexibility of distance learning programmes allows students to continue working, support their families, and gain social benefits while obtaining education.

For many students interviewed, a prime advantage of distance learning programmes is their structure, which allows the training to be planned around work schedules and enables participants to study from home. Numerous students noted that they enjoyed being able to support their families through the income received from working while simultaneously earning an upgrade (see also point 9 below).

Surveyed health care workers, many of whom were considering enrolment in a distance learning programme, stated that the open structure of such programmes is particularly appealing for similar reasons. As one respondent commented, ‘This [distance learning] is proper for me, since it will not involve me to move away from my work place.’ Several health care workers noted that being close to their families was another prime benefit of distance learning. ‘Distance learning could meet my training needs by correspondence through e-mail and internet. I do not need to be confined in class or school and could easily continue taking care of my family and other business.’ Another respondent mentioned that she had not entered a residential upgrade programme because she feared ‘leaving her family alone’, but that distance learning would provide an opportunity to stay at home and still advance her knowledge and skills.

Results of the focus group discussion with partner training organisations highlighted themes similar to those that emerged in interviews with distance learning students and programme managers and in the health care worker surveys. For example, discussion participants agreed that ‘for social reasons, it would be preferable to work from their homes.’ One distance learning tutor concurred, noting that ‘uprooting the learner creates a vacuum, not only in their workplace, but in their family and community. Distance learning is better socially.’

At three institutions offering upgrade programmes, students often meet face-to-face (two to three times a week). They also frequent internet cafés and libraries to use computers and other resources. Students in the Aga Khan University nurse upgrade programme found this self-directed component of the programme to be extremely beneficial. One student in the university’s Zanzibar programme said, ‘Sometimes students divide up the research topics, we do the research, and then come together as a group to present so that we can learn about many topics from each other.’
7. **Distance learning allows Health Training Institutions (HTIs) that host residential students to maximise their physical space and resources.**

All programme managers at government HTIs and private universities stated that distance learning helped alleviate the demand for space (in both classrooms and residence halls) resulting from increased enrolment as institutions try to respond to MMAM. One site representative noted that space on campus to hold classes is limited, and having distance learning students come only a couple of times a month for classroom-based sessions helps alleviate this burden. A staff member from one of the HTIs visited said, ‘Our resident housing is full; if we do not provide a distance learning track, we will not be able to increase our enrolment.’

*Library at Maswa CATC campus for clinical assistant to clinical officer national upgrade programme*

Distance learning also provides a creative solution to increasing the health care workforce. Converting existing resident upgrade programmes to distance learning upgrade programmes increases both the residential and classroom space available at HTIs for pre-service training, thus responding to MMAM’s mandate. One HTI principal said, ‘Because of MMAM, we must increase enrolment but have no increase in funds for enrolling more students. So, we need to make distance learning programmes successful.’
8. Distance learning programmes typically cost less to run and are more affordable for students than on-site programmes.

Although the assessment teams were unable to gather specific cost data for the Tanzanian context, other distance learning studies suggest that distance or e-learning programmes can be less costly. Cost savings generally accrue when the programme reaches a large number of students (Curran, 1989). Examples include low-cost webcasting and television broadcasting (Klees and Mayo, 1974). Limited data are available on the costs of different media, and it is difficult to make comparisons because of differences in programme requirements and types or mix of technologies used. Few studies have specifically addressed cost analysis for distance learning programmes targeting health care workers. Distance learning programme costs can vary greatly depending on start-up, maintenance, and personnel expenses.

Factors influencing lower costs for health care worker distance learning programmes compared with on-site programmes include lower costs for personnel, administration, travel, room and board, and use of training facilities (WHO, 2001). Studies of computer-based IMCI courses for health care workers in Uganda and Kenya have demonstrated that cost savings stem from shorter training, which translates to lower costs for facilities and tutors (Tavrow et al., 2002; QAP, 2006). The WHO ICATT computer-based programme being adapted for the Tanzania context was specifically developed with the aim of reducing costs for the Tanzania MoHSW in conducting IMCI in-service training across the country. The programme manager noted that cost-effectiveness will be evaluated during the pilot roll-out, expected to occur sometime during late 2008.

The CDE conducted a cost analysis of the clinical assistant to clinical officer distance learning upgrade programme compared with the corresponding residential training upgrade programme. It found that the cost to the MoHSW for maintaining one distance learning student for 1 year is TSH 172,000 (USD 143), compared with TSH 300,000 (USD 250) for one student for 1 year for the residential course (MoHSW, 2007b).

Although the assessment teams were unable to gather any specific cost data for other programmes, all programme managers said that distance learning upgrade programmes are less costly than residential programmes, requiring fewer tutors, less classroom space and equipment, and lower housing and food costs for students. One programme manager said, ‘The students are not present on-site the entire length of the programme (only during face-to-face sessions), so we pay less costs for them than for our residential students.’
Students also cited cost as a reason for choosing distance learning over residential programmes. Most of the distance learning programmes are subsidised (by either the government or other scholarships), making tuition low-cost or free. Students’ ability to work as they study also contributes to the decreased cost of the programme, as they are able to earn money to support themselves and their families. One student said, ‘I could not upgrade myself if I could not continue working to support my family. Distance learning is my only choice.’

Results from the surveys of health care workers suggest that the cost-effectiveness of distance learning programmes is a major attraction for those considering enrolment. One respondent remarked, ‘Distance learning will reduce the cost needed for me to travel or to be apart from my family, which will need finances for food and other things.’ Another health care worker said that he believed distance learning could meet his training needs for three reasons: ‘1) It is cost-effective, as it will be taking place at my physical location (no accommodation, food and transport costs). 2) It is productive, as I will be continuing to do my daily job and other private activities. 3) It is socially-effective, as I will be with my family as usual.’ Both current and prospective distance learning students continually emphasised these points, indicating the financial and social benefits compared with residential programmes.

Participants in the focus group discussion with partner training organisations also agreed that distance learning is a less costly approach. As one participant explained, ‘Many more people can be trained at the same time, instead of pulling a few people to come to a workshop. Costs would be lower.’

9. **Distance learning students can remain in their workplace while studying in upgrade programmes, and HTIs are freed up for pre-service training.**

As discussed above, students enrolled in distance learning programmes can continue to work at health facilities within their communities while they are studying. Thus their training does not decrease the time they spend treating patients. Students also work at public hospitals as part of their practicum.

An MoHSW representative agreed that ‘[Distance learning] is a better option than always having health care workers leaving their working stations for training.’ This point was echoed by participants in the focus group as well, who emphasised that there is so much training targeting health care workers, particularly the lower cadres, that they are gone from their facilities for days to weeks at a time.

The surveys of health care workers also conveyed positive feedback from prospective distance learning students, who frequently mentioned the importance of being able to continue working while studying, thereby decreasing the strain on human resources that already exists in Tanzania. One respondent aptly explained why it is so critical for health care workers to remain in the workforce to the extent possible while studying: ‘…the region or nation at large has a shortage of about 70 per cent (only 30 per cent staff available), and thus if distance learning will be applied, the staff will continue working, avoiding paralysis of the facility.’

The CDE noted that health care worker shortages are also reduced through in-service and upgrade distance learning programmes because HTIs can reserve all their training slots for pre-service training. Thus greater numbers of new health care workers can be trained.
10. **A pool of trained distance learning tutors in Tanzania supports the national health care worker upgrade programmes.**

The CDE has sent 11 Tanzanian tutors to be trained in distance learning instruction and curriculum development in the UK, and these 11 helped train 48 additional tutors in Tanzania. There are approximately 6 tutors trained in distance learning in each zone, as well as some clinical tutors and mentors. Some trained tutors based at HTIs throughout the country have helped develop modules for the print-based curricula. The clinical assistant to clinical officer module was developed by COTC tutors; the maternal and child health aide to enrolled nurse module was also developed by distance learning tutors from this programme. The CDE was not involved in the development of the enrolled nurse to registered nurse curriculum, which was created by Aga Khan University.

11. **To enhance learning, distance learning programmes in Tanzania use a blend of techniques: print-based learning, self-study, face-to-face classroom-based sessions, and practica at local health facilities.**

Most programmes targeting health care workers use distance learning to enhance, not substitute for, practical or face-to-face learning. This blended learning approach allows students to gain both knowledge and skills to enhance their education.

Students interviewed noted that the face-to-face portions of their training were essential and one of the most useful parts of their distance learning programme. One student from the Aga Khan University nurse upgrade programme in Dar es Salaam remarked that she did not want to miss a single day of the face-to-face sessions. Face-to-face sessions are particularly useful in clarifying information obtained from self-study. Those programmes that integrate a face-to-face component at the beginning, at the end, and at intervals during the programme make students feel more connected to the tutors, other students, and their studies. One upgrade programme that did not integrate this component until the end left many students feeling disconnected from their tutors, fellow students, and preceptors and frustrated with their learning experience.

Practica were included in each programme. Because most distance learning students are also employed at a health facility, one programme manager noted that these clinical sessions allow students to apply practical skills on the job, thus fortifying immediately what they have learned. One tutor commented that assignments in distance learning programmes are more realistic than those in residential programmes and are directly related to the students’ jobs.

12. **Students in distance learning programmes benefit from collaboration with each other.**

Students mentioned that learning from each other was beneficial to their studies. While some programmes did not link students, those that did so made students feel better connected and more enthusiastic about learning. Students in one programme initiated meetings with each other and divided up complex content in order to teach each other. In one programme, students recruited and paid a content expert to speak to the group about topics that were difficult for them to understand. Regardless of whether a programme built student communication and collaboration into its structure, students felt it was important to build their own learning community.
13. **Students, tutors, programme managers, and IT specialists are overwhelmingly positive and enthusiastic about distance learning programmes.**

Of 36 distance learning students interviewed, all but 1 expressed a high level of enthusiasm for distance learning. One of the main reasons cited, as previously mentioned, is the flexibility such programmes allow. Many students interviewed said they would recommend the programme to friends or would enrol in another distance learning programme in the future. Tutors were also enthusiastic about distance learning. One noted that the entire faculty really wanted to see distance learning ‘take off’ in Tanzania.

Students also reported that distance learning faculty were helpful and responsive to them. For some programmes, such as the Aga Khan University enrolled nurse to registered nurse upgrade programme, students noted that they chose it because it was accredited by NACTE, the national accreditation body in Tanzania, and they would be able to ‘get a job anywhere in the world’. NACTE accreditation also makes it easier to obtain a government job and to gain entree into the government system. Others commented that they liked the programme because it had a good reputation.

Some students felt that the purpose of learning is more apparent in distance learning. One student noted that ‘time is not wasted’ as in traditional programmes.

Students also enjoy gaining computer and English-language skills, which are indirect benefits of the programme. One student said, ‘My English has improved during this programme.’ Another said, ‘I know how to use the internet for finding the answer to a question.’

Enthusiasm was evident even among the group of surveyed health care workers, many of whom expressed their intention to enrol in a distance learning programme. When asked whether they would join such a programme if one were offered in their region, 91 per cent replied that they would. Of the 46 respondents, more than half said they had a friend or colleague currently enrolled in a distance learning programme. Respondents also made numerous positive comments about what they had heard about the programmes, such as, ‘The benefit to individuals who have attempted this type of learning is that [they] have improved their work performance and added to their CV.’ The survey results suggest that not only is there a high degree of interest in and enthusiasm for distance learning among prospective students, but many of them have been positively influenced by their colleagues’ experiences with such courses.

14. **Distance learning fosters increased self-confidence, self-discipline, and self-motivation in students.**

Students interviewed expressed increased confidence in their ability to learn as a result of the structure of distance learning programmes. One student said that studying alone ‘prepares you well and builds confidence and increased level of understanding of research’. Students also often learn from each other during self-study. One student noted that she felt more prepared for her work when she found an answer to a question herself without the help of an tutor. One student said, ‘This is adult education; we only use the teacher when we have a hard question.’

15. **Many programmes and sites visited have computers and internet capabilities, and most students are able to access computers and the internet through internet cafés.**

Students in the enrolled nurse to registered nurse upgrade programmes said they used a computer during their studies and in many cases said they were required to do so, while
students in the clinical assistant to clinical officer and maternal and child health aide to enrolled nurse programmes were not required to use a computer. Most programmes had at least one computer at their facility for students to use. Only one of the students interviewed reported having a personal computer. Several students accessed computers and the internet at work or at their institution, but the majority did so at internet cafés. Although students said that computers were slow and expensive to use and that they needed more computer skills, all said they were able to access a computer if they needed to do so. Tutors interviewed said they had easy access to computers and used them in their daily work.

16. **Exposure to computer training and information and communication technology (ICT) in some distance learning programmes provides students and tutors with basic skills and capabilities.**

While almost all students and tutors said they could benefit from more training in ICT skills, most had received some exposure. The majority of programmes require some use of a computer to communicate via e-mail, conduct research, locate particular web resources, and access web-based libraries, although many students lacked the access or training necessary to become skilled in navigating the internet and using e-mail. One student commented, ‘I am interested in learning more computer skills when I graduate. I am thinking of taking a computer skills course.’

Tutors interviewed reported that they frequently used e-mail and had a range of computer skills, from basic to advanced.

17. **Incremental improvements in ICT infrastructure are being planned at many sites offering distance learning.**

While ICT technologies and equipment are generally limited in many distance learning programmes, expansion is planned at most sites visited. One programme was doubling the number of computers available to students. Another programme was developing partnerships to build its capacity in distance learning and create computer resource centres that could be accessed by distance learning students and health care workers participating in continuing education activities.

The CDE enrolled nurse to registered nurse programme has purchased a license for the web-conferencing software Elluminate. It plans to pilot use of Elluminate for this programme.

AHADI Institute announced that it will be creating the Chemchemi Educational Resource Centre, which will include the Aden Centre for Information and Communication Technology. The Aden Centre’s objective will be strengthening a virtual library and the use of the internet for e-learning.

Finally, IICD is planning to open an e-learning support centre in September 2009 at MUHAS. One purpose of this centre will be to support the CDE, ZHRCs, and study centres in the use of e-learning for health care workers in Tanzania.
5 Challenges and Constraints

Despite the numerous achievements and benefits of distance learning in Tanzania, there exist many challenges and constraints. They include bureaucratic impediments to creating effective programmes; a lack of guidance and support for staff and students involved in programmes; and infrastructure, training, personnel, funding, resource, technological, and curricular constraints. Note that to maintain confidentiality, the names of organisations and programmes with which those interviewed are affiliated generally are not cited in this section. The emphasis in the discussion is on the CDE because of its integral role in scaling up national distance learning activities, and issues related to the CDE are highlighted as the basis for many of the detailed recommendations presented in Part III of the report.

1. The CDE faces serious challenges due to its centralised structure and lack of coordination.

The challenges faced by the CDE include the following:

- A severe shortage of distance learning staff; currently there are only two employees.
- Inadequate funding from the MoHSW for office operations, learner support, capacity building, training of distance learning experts, development and distribution of modules, and grading and monitoring of student work.
- Use of print media only; no use of CD-ROMs or other electronic media.
- Limited space for programme management. Although the CDE is the national coordinating centre for distance learning in Tanzania, it is housed in only one small room at the Eastern ZHRC. Classroom space for face-to-face sessions must be shared with the ZHRC and the Morogoro Public Health Nursing School.
- An inadequate number of distance learning tutors and preceptors to support learners in face-to-face sessions, clinical placements, and practicum assessments.
- Computer illiteracy among many distance learning students.
- Inadequate publicising of distance learning programmes to various stakeholders, including employers.

Overall, with the advent of MMAM, the CDE is challenged to identify strategies for increasing enrolment and output and introducing more distance learning courses in response to high demand, while at the same time ensuring that a high-quality education is provided to all distance learners.

Decentralised control of distance learning is preferable and considered most effective by all programme managers interviewed at the national and zonal levels. Yet while plans for the national distance learning programme include decentralisation, with the ZHRCs and HTIs expected to assume a major role in recruitment and monitoring of students, this decentralisation is not taking place because of funding constraints. The CDE in Morogoro is funded directly by the MoHSW. In the past, none of these funds have been allowed to be
released to ZHRCs and HTIs for coordinating and managing distance learning programmes at the local level. This lack of support to ZHRCs and HTIs has made programmes less effective.

Given the proposed increased funding for the CDE the 2008–2009 fiscal year, as well as proposed distance learning funding available to ZHRCs and HTI study centres, the CDE believes that the role of the ZHRCs can be expanded to include enrolling students in distance learning, supervising them during their studies, marking assignments, meeting with students in face-to-face tutorials, and submitting progress reports and marks to the CDE. The CDE would then have a strictly coordinating rather than an implementing role.

The current centralised structure is problematic for both the CDE in Morogoro and the ZHRCs and HTIs. The CDE is the only distributor for curriculum materials, and it is also the only centre that distributes, receives, and grades all the assignments of 900 students. This is a daunting task for only two staff members (sometimes with the assistance of public health nurses). In addition, since all tests are also graded by the CDE staff, the local HTIs that serve as study centres for the distance learning students do not know the students’ skill levels and their strengths and weaknesses, and thus do not know how best to assist them. The CDE is also solely responsible for processing student applications, and therefore is overwhelmed by the large number of applications it receives.

In addition to coordinating services for all 900 students, the CDE must coordinate with preceptors for the practica, tutors for training and curriculum development, and ZHRCs and HTIs for exams and on-site sessions. As a result, preceptors, tutors, learners, and programme managers face major challenges. For the CDE, the joint roles of building capacity for national distance learning programmes for health care workers and managing day-to-day operations of all of the above is simply infeasible.

The centralised structure and heavy work burden of the CDE also compromise communication between the CDE and ZHRCs and HTIs and between the CDE and students. HTIs that act as study centres for the clinical assistant to clinical officer programme struggle with determining how best to support students without sufficient information. One programme manager reported that he does not even have knowledge of or contacts for local students in his district until the students’ last year of this 3-year programme. One HTI manager complained that when students in the local area were notified to attend a face-to-face session, he received only a list of their names and no other contact information. Some students never appeared, and he expressed frustration that he was unable to find out why.

The HTIs receive no documentation on students’ progress on assignments and exams or any clear information about their performance in their practica. As a result, the HTIs cannot identify areas in which students need assistance during the on-site study component or what practical skills to focus on. One manager at an HTI commented that he was not provided a basic schedule for the distance learning programme, including a schedule for content with time frames for completion, so he was unable to understand the programme’s structure. Students made similar comments.

Financial constraints and centralisation of authority were important themes in interviews with programme managers, tutors, and preceptors. One of the preceptors interviewed said she had been promised overtime pay for extra hours worked on the distance learning programme, but thus far the MoHSW had not released the money to the programme. Another preceptor described a similar scenario, saying he had not yet been paid although he had ‘been promised’ that he would be compensated for his work. Managers interviewed at ZHRCs and HTIs suggested that each zone should have its own budget to support the distance learning programme.

One manager at an HTI stated that it would be useful for those at ZHRCs, HTIs, and the CDE who are involved in conducting distance learning programmes to share experiences across programmes, such as best practices and lessons learned. He said a few meetings of
COTCs had taken place, but there was a need for more sharing of information, as well as a forum to identify solutions to coordination problems with the programmes.

2. National programmes lack guidelines and specification of competencies for programme managers, tutors, and preceptors to clarify their roles and responsibilities.

Programme managers, tutors, and preceptors interviewed reported that programmes lacked sufficient guidelines for staff. This deficiency was most apparent among preceptors. According to various programme staff, preceptors are given no guidelines for working with students. Some programme staff noted that preceptors are given inadequate guidance on how to provide useful feedback during on-site training. Although the CDE has developed guides for distance learning tutors and learners, these materials have not been disseminated.

There are also no standards for what competencies students should demonstrate as part of their practicum experiences. Feedback forms from practica are meant to provide information on whether students are ready to sit for their exams and in what areas they need additional training. A programme manager noted that the documents given students by preceptors noting their clinical abilities were not useful to the HTI in assessing the students’ skills and clinical abilities. He said, ‘This tells me nothing about what the student can do.’ The forms listed areas such as ‘paediatrics’ and ‘gynaecology’ with notations such as ‘good’ and ‘fair’. The manager said, ‘I don’t know what this information means or how to guide the students with their studies.’ He reported being unaware of any explicit competencies expected of practicum participants.

Two upgrade programmes included a 3-week community service field-based component. While students said this component was interesting and necessary, five of them said their tutors did not accompany them to the field or give them direction on what to do.

Programme managers at the HTI study centres lack clarity as to their roles in coordinating distance learning students when residential students are also present on their campuses. This lack of clarity is apparent as well in the relationship between tutors and preceptors. Tutors stated that they did not communicate with preceptors about student performance even though doing so would have been helpful. Programme managers also noted that they would like to have more communication with preceptors to get a sense of students’ abilities and skills and thereby determine their training needs.

This information was confirmed by interviews with preceptors, all of whom said they receive minimal guidance from coordinators on what competencies students should master. One preceptor stated, ‘There don’t seem to be any clinical guidelines or objectives.’ Another said that he has no interaction with the course coordinator; rather, he is just told ‘that the students are coming’. Others admitted that they use their own judgment and experience to determine what students need to learn and the competencies they need to acquire. One preceptor said the courses lack organisation and recommended establishment of a set schedule, ‘to be planned out with hours allocated for specific subjects and practical rotations’.

3. Programmes provide inadequate support for students.

Students lack support in national distance learning programmes in a variety of ways. These include a lack of financial support; no formal preparation for study through the distance learning modality; insufficient feedback on performance; inadequate support from tutors, preceptors, and classmates in the learning process; a lack of support in attaining English-language skills; a lack of administrative support; and in some cases, a lack of support from their employers as they progress through the programme.
Lack of adequate financial support for students to cover additional costs associated with participation in distance learning programmes. While the MoHSW pays tuition fees for distance learning programmes, many students commented that there are numerous additional costs. These costs include computer and internet use in internet cafés; photocopying and printing services to copy modules, books, and other resources; secretarial services to type papers; payment for content experts to provide further instruction; and transportation to use library services, meet with other students, meet with tutors, and get to the internet café. The majority of students commented that ‘distance learning is very expensive’.

Because printed resources are so scarce (see the discussion of infrastructure [point 4] below), students must photocopy these materials from the library if they want to study them outside of the library. One student failed to receive her modules for the programme for several months, so she took a single book to be printed. The cost was TSH 29,000 (USD 24), and the book is currently waiting at the print shop while she saves up enough money to pay for it.

Insufficient preparation of students for study through the distance learning modality. Distance learning requires that students be self-motivated to study and self-directed in their learning. This modality is new and difficult for some students. Tutors and programme staff interviewed stated that students in Tanzania are ‘not used to being self-motivated learners’ and that their basic education does not prepare them for this kind of learning. Four tutors stated that students needed training in how to learn through distance learning. Another tutor said, ‘Students need study skills that will help them find resources on their own.’ Students also cited difficulty with finding materials on their own either because of infrastructure issues (e.g., all books are checked out of the library, or they are unable to access the internet at the library) or their inability to find an internet site. One student said, ‘Teachers have so much more information than me. I don't know how to find it.’

Another important issue for students is time management, such as balancing work, home, study, and practicum activities. Although some programmes provide student orientation, students, tutors, and programme managers interviewed said little information about time management and self-directed learning is included to prepare students to be successful in this type of learning.

Insufficient feedback on performance. Many students in upgrade programmes said they received inadequate or in some cases no feedback on their performance. Several students in one national programme said they had received no grades or feedback on any assignments for 7–9 months. In an extreme case, one student said he had not received grades or feedback on any tests or assignments he had sent in for 2 years (in a 3-year programme).

In one 3-year programme, students are in residence at an HTI for the last 6 months of the programme. Although they take a pre-test before entering the residency, no one (e.g., a mentor, tutor) is assigned to help them determine the level at which their coursework should begin. Thus when they arrive at the institution, no information is available to help the HTI place them at the appropriate level of study.

When students have questions as they study on their own, there is often no resource to provide answers or assist them. Although tutors noted that students are given feedback during face-to-face sessions, in general most students said they received insufficient feedback on their performance.
Inadequate support from tutors, preceptors, and classmates in the learning process.

Tutors interviewed said that students are somewhat isolated from other classmates and have ‘no one to compare themselves to’, which, some felt, could cause them to lose motivation to study. Yet while students interviewed said it is difficult to arrange meetings with fellow classmates, many felt it imperative to do so and often used their mobile phones or SMS for the purpose. In one national programme, on the other hand, several students were not even aware that there were fellow distance learning classmates in their area. One student said he had studied in the programme for two years, and only during the interview for this assessment did he find out that there were two other students in his area. Another student interviewed stressed the importance of providing this information to students because it is an effective and simple way to improve local support for distance learners.

Students interviewed also said they have little contact with tutors aside from already minimal face-to-face time. The majority of students said tutors were available when called or e-mailed with questions, but noted that they were more likely to seek the help of other students in the programme or another person in their community, workplace, or health facility that seemed knowledgeable.

Such isolation also persists within the practicum component of the programme. Students reported having little contact with preceptors aside from asking them to ‘sign off on some paperwork’. Some students said they are more likely to ask a question of their ward supervisor than their preceptor. Preceptors themselves frequently mentioned wishing to have more time to spend teaching students in person, but a combination of lack of pay, space, and time generally made this impossible. This challenge is discussed in greater detail in the section on preceptor shortages under point 8 below.

The issue of student isolation also emerged in interviews with MoHSW representatives, who reiterated the importance of support from fellow students if a distance learning programme is to replace in-residence, classroom-based learning. ‘It would be important for there to be more than one [distance learning] student at a particular health facility so they can support each other.’

Lack of support in attaining English-language skills. According to several tutors interviewed, poor English-language skills (especially writing) are sometimes a barrier to students’ learning effectively through distance learning. Programme staff and tutors commented that this lack of English-language skills is attributable to the fact that the Tanzanian educational system is not as developed as that in Kenya and Uganda. Many tutors and programme managers noted that their students lack a good basic education and that they need support in learning English. In Tanzania, the secondary school enrolment rate is 5 per cent, and the tertiary rate is 1 per cent, among the lowest in sub-Saharan Africa (see Figure 3). One tutor suggested a ‘crash course’ in English such as that offered as part of teacher training by Tanzania’s Ministry of Education to improve language skills. One tutor noted, ‘It is critical to address language skills, especially writing skills.’
According to government policy, materials for higher education are in English, and courses are conducted in English. Some tutors stated that materials in Kiswahili should be made more available to students. One tutor suggested translating some training materials into Kiswahili in the future. Another tutor emphasised the need for more classroom time so a tutor can translate materials for students and explain them in Kiswahili. Yet while producing distance learning modules and materials in Kiswahili would improve comprehension and learning, the policy of conducting pre-service, in-service, and upgrade residential courses for health care workers in English is a barrier.

The need for materials available in Kiswahili is apparent from the fact that, while most of the interviews for this assessment were conducted in English, some of the students needed a Kiswahili translator or were interviewed by a team member in Kiswahili. Most students interviewed in English appeared comfortable speaking the language, but their fluency levels varied widely. Students noted that their face-to-face training sessions were conducted for the most part in English, sometimes in ‘Swanglish’ (a combination of Kiswahili and English); their tests, assignments, and materials were in English; and their informal group meetings and discussions of course content were in Kiswahili or Swanglish.

**Lack of administrative support.** Many upgrade programmes failed to provide students with adequate administrative support. One programme had no paid staff; thus, a student served as a coordinator and advocated for students. His role required much unpaid work, and he felt he was unable to provide as much support as was needed for students in the programme. In another programme, financial constraints left students without adequate information about the structure of the programme and the timeline for their course work. In some cases, a few programme managers were trying to manage large numbers of students. As a result, many students lacked basic programme information, such as when the next face-to-face sessions were scheduled and what materials they were supposed to be studying.
Lack of support from employers as students progress through the programme. Most students reported that their supervisors were supportive of their studying in distance learning programmes. However, students in one programme noted that the supervisors at their health facility often created a roster that conflicted with their study schedule. Programme managers suggested that it may be necessary to better explain to employers what students’ schedules will be like and what expectations/commitments employers should anticipate.

The same issue emerged in interviews with MoHSW representatives, who regarded employer support as a challenge to implementing the ministry’s distance learning programme. One representative commented, ‘There needs to be employer buy-in, a proper learning environment in the workplace and time set aside in the employee’s workday.’ Focus group participants likewise suggested that if distance learning is to function effectively, a formal policy allowing students to take time off from their work for study and training will be necessary.

4. Infrastructure challenges prevent programmes from being planned and implemented effectively and in some cases affect student learning.

Infrastructure challenges are severe in national distance learning programmes. In many of the distance learning programmes surveyed, there is a lack of proper space for training during face-to-face sessions, libraries, equipment, and amenities for students. A second major challenge is a shortage or lack of learning materials for students. A third challenge for many programmes, and one that affects all other infrastructure constraints, is a lack of adequate funding. It is discussed separately below (under point 7), as are infrastructure challenges related to computers, resource centres, and other equipment (see point 6).

Lack of space for students. While an advantage of distance learning is that it frees up space in HTIs for pre-service training, adequate space is still necessary for face-to-face sessions, portions of the programme that require students to be in residence, on-site orientations, and computer lab and library use. Some ZHRCs and HTIs struggle to provide distance learning students with housing during residential portions of the programmes. In one national programme that requires distance learning students to stay at the HTI for 6 months, space for this purpose is not available at the HTI, which is more affordable than a guesthouse. Thus distance learning students have to pay more out-of-pocket costs for lodging and food during this portion of the programme. This in turn limits the time they can spend on site, which for many is one of the most valuable programme components. One student said, ‘I want to stay longer [at the HTI] to use the library and discuss with my teachers, but I cannot afford to study here [as much as I would like].’

One upgrade programme had no space for students to use for face-to-face sessions; students had to find their own space each time such a session was scheduled. In some cases, other organisations donate computer use, library use, or classroom space for students. One programme that borrowed space from another organisation had only one small shelf for books and printed resources. One preceptor mentioned that he would like to have access to a classroom so he could teach his students theory, an area in which he felt they were lacking; however, such space was not available.
Zanzibar Nurses Association allows students from the Aga Khan Univeristy enrolled nurse to registered nurse upgrade programme to meet in their office and use the secretary’s computer (when available).

**Shortage or lack of learning materials for students.** All students interviewed had experienced shortages of printed learning materials. At one institution, there was one module for 24 students to share. No programmes visited offered electronic materials on memory sticks or CD-ROMs to students, although one programme did have CD-ROMs available for tutors and programme managers. In one programme, most students received materials only intermittently (one had not received anything for 9 months, another for 2 years, as mentioned above). In the meantime, they had to discontinue their studies or travel to the HTI to borrow old modules to study from the library, but they could not check these materials out. This created an inconvenience for students, who could not take materials home to study. One student in a national distance learning programme said he had called the coordinator to ask where the materials were. He said he had been told politely that money to print the modules was not available. The CDE also cited this constraint, due to a lack of adequate funding for its programmes. This problem is not unique to national programmes. Printing is expensive for students, as mentioned above. One programme uses printed materials from Nairobi, Kenya, which are consistently late arriving in Tanzania; often they arrive after students have already begun their courses.

This shortage of materials was apparent during the site visits made to distance learning programmes. The assessment teams were unable to obtain materials for review because even the institutions themselves lacked adequate numbers of copies.

All upgrade programmes visited had a library for students, although the library materials were limited in most cases. Students in some programmes said materials were ‘never there’. In other programmes, students had few books to study, and the ones that existed were often from the 1990s or earlier. In one programme, 24 students shared one small shelf in a library, and they were not allowed to check books out, but had to study them at the library so all students would have access.
5. Information and marketing materials about the programme are lacking.

Only one of the distance learning programmes visited (CEDHA’s Health District Management Diploma) had information, websites, or brochures about the programme. If enrolment of health care workers is to increase, potential students and employers must learn about distance learning opportunities. Most information about programmes is spread by word of mouth, according to programme managers.

6. Students lack basic computer skills, access to computers and the internet, and IT support.

Lack of basic computer skills and access to computers and the internet. The vast majority of health care workers surveyed said they would apply to a distance learning programme if one were offered in their region. Of those that said they would not, one reason given was a lack of computer skills and access to the internet. As one respondent noted, ‘I wouldn't apply because of lack of knowledge on computer use. Also, there's no internet services installed in the institution where I am working. Though services can be obtained in the business chambers, they are very expensive.’

Nearly all students interviewed lacked easy access to computers. Only 1 of 36 students interviewed had a personal computer. All programmes had a limited number of computers available for student use. For example, one programme had one computer for 24 students that was available only intermittently, as it was used by a secretary during business hours. Another programme had five computers for 100 students, and they were used by 200 more students in another department. Another programme had four computers for 50 students. The internet was available on some of these computers but not all.

Given this unavailability of computers, students often reported accessing them at internet cafés, but noted that doing so is expensive at TSH 1,000 (USD 0.83) per hour. Three students said they used the secretary’s computer at their workplace. One student said she ‘begged the secretary to let her stay after work to use her computer’, but sometimes this was not possible because she needed a key to stay after regular work hours. One solution to limited internet
access for students in one upgrade programme was to rent an internet café twice a week in the afternoons for students to use. Although students found this arrangement very helpful, it lasted only a few months as funding for the purpose ran out.

Although most upgrade programmes required students to find resources online, many students said they struggled doing so because of their lack of skills and experience in searching the internet. One tutor said students needed training in how to access online libraries since printed materials were so limited. One programme did not require students to use computers at all. Some of the students in this programme felt they should be taught how to use computers and the internet, while others had no interest and did not understand why computers were important. Students from some programmes mentioned that they worked together in small groups to help each other learn how to do research using the internet and acquire computer skills by going to internet cafés together. Students also appeared to use e-mail infrequently. Two students said they did not use e-mail because it ‘takes too much time’ and is ‘a waste of time because it’s too slow’. This may be because in many internet cafés, connection speeds are slow.

Students said they needed to develop typing skills but could not do so without computer access. Most reported not knowing how to use Microsoft PowerPoint or Excel, but said they could perform the basics in Microsoft Word. Students were not familiar with Adobe PDF. Although training in computer skills is offered at the start of some of the programmes, students feel they do not improve those skills very much thereafter because of their limited access to computers. In addition, the courses are short, and they may be ineffective in imparting necessary skills because of the limited computer and internet skills of students entering the programmes. According to the programme managers and IT specialists in distance learning programmes that offered initial training in computer skills, many of the students had never before touched a computer. Students were generally taught the basics: how to use a mouse, how to open Microsoft Word documents, how to access the internet, and how to open an e-mail account and check and send e-mail. Only some students interviewed said that they had flash discs (memory sticks), but those that did found them useful. Some students said they were encouraged to take a computer skills class before entering their programme, but most had not done so. One student who did take a computer course prior to her programme reported that it was helpful and made her feel confident about working with computers, but she felt she still needed more ongoing computer training.

Programmes that used the internet as the primary mode for delivering learning content (I-TECH’s HIV/AIDS Clinical Seminar Series and Harvard University’s HOPE Project) had encountered challenges involving slow bandwidth, which sometimes impacted a session. A HOPE webinar programme that uses a platform called Centra 7, aimed at practicing clinicians, lost attendance, according to the programme coordinator, because students could not log on to the live sessions easily or quickly. Moreover, their connection was intermittent, causing their site to go in and out of the virtual classroom and resulting in the participants missing much of the sessions. I-TECH’s webinar programme, which uses Adobe Connect Pro Live, had some difficulties with its internet connection, such as in logging on to the session, but overall the programme works fairly well.

The enrolled nurse to registered nurse programme at Aga Khan University in Dar es Salaam, Zanzibar, and Morogoro began piloting the use of Elluminate as a virtual classroom for live didactic sessions. One IT specialist reported struggling with the small amount of bandwidth available to make the sessions successful. Nonetheless, the programmes remain forward thinking about overcoming barriers to live web-based distance learning by experimenting with using different types of connections, sharing bandwidth with others, and obtaining more bandwidth.
One further challenge is that internet use is expensive for institutions. One IT specialist reported that his institution pays USD 4,800 per month for a 512K modem.

Lack of IT support. With no one to turn to for their IT support needs, some students said they worked together in pairs or small groups to learn how to use the computer and access online resources. In one programme that did have IT support but whose IT specialist reported being overwhelmed by his responsibilities, students often asked librarians or secretaries for help in using the computer and the internet. Shortages of IT personnel are discussed further under point 8 below.

7. **Inadequate and undependable funding is a widespread problem.**

As previously mentioned, the national programmes lack funding to support ZHRCs and HTIs in coordinating distance learning programmes, but institutions also have difficulty receiving funds for distance learning students’ tuition. Most programmes reported that funds from the MoHSW for student tuition were late or were not received at all. Several distance learning programme managers noted that bureaucratic impediments often render the allocation of funds for students’ tuition undependable. It is unclear whether this is a problem unique to distance learning programmes or whether it occurs in residential programmes as well. Some students whose tuition had not been paid by the MoHSW expressed concern that if the government did not pay their tuition, the school would not allow them to graduate. One student said, ‘In the past the financial manager [from the HTI] would give updates and information to the students about it [the MoHSW not paying tuition], but now he says nothing to us and has stopped all communication with us—even when we ask him. We are worried
about this. We worry that the institution will tell us we cannot graduate because the Ministry
did not pay our costs.’

8. **Personnel shortages negatively affect student learning and the sustainability of
distance learning programmes.**

Distance learning programmes face severe shortages of personnel, including qualified
tutors, preceptors, coordinators and administrative staff, and IT personnel. In many cases,
these personnel shortages are due to a lack of funding, training, and/or qualified staff.

**Shortage of qualified tutors.** Distance learning requires a significant amount of dedicated
time from tutors. These requirements may be exacerbated by existing shortages. In some
programmes, tutors must travel to their students. Tutors feel the travel is dangerous (at night),
and the per diem is inadequate to cover their expenses. Programme managers for these
programmes said they thought it could be a challenge in the future to maintain tutors. In other
programmes, residential tutors receive no additional compensation for the extra time they
spend teaching distance learning students; thus, they have no motivation to do so and refuse.
Students in one upgrade programme complained that at times, the tutors skipped a face-
to-face session or were absent during all or part of a 3-week field-based community service
component. The tutors did not reschedule the classes, even when requested to do so by the
students. Students said they felt frustrated that tutors were not held accountable for their
absences from the programme.

**Shortage of preceptors.** In the programmes surveyed, preceptors were not paid to work
with students. The interviews with preceptors also revealed that none of them were paid for
their time and contributions to distance learning programmes, despite repeated promises of
remuneration. As one preceptor commented, ‘We should be given an allowance as an
incentive, since we spend more time with the students than the faculty do.’ Many mentioned
that the best part of being a preceptor for a distance learning programme is the opportunity to
teach students in practical sessions. Because of other responsibilities, limited time, and a lack
of compensation for their distance learning work, however, it is difficult for them to devote a
significant amount of time to the programme. One preceptor described how committing
additional time to the programme was challenging because ‘other staff feel you’re escaping
from the normal duties … the work has no motivation from the programme organisers’. At
the same time, all of the preceptors agreed that students require more face-to-face time in the
classroom. Thus, insufficient resources are provided to preceptors for assisting students at the
level that is necessary.

**Shortage of support staff (coordinators, administrative staff).** A good example of staff
shortages is the CDE in Morogoro, which has only two staff overseeing all of Tanzania’s
national distance learning programmes. Their responsibilities, as enumerated under point 1
above, render successful administration of the programmes nearly impossible. HTIs visited
reported needing more support from the CDE in administering the programmes. Another
distance learning programme visited did not have a local coordinator on site. One programme
manager who oversees a regional distance learning programme in four districts noted that it is
difficult to coordinate the programme as he would like if he had sufficient resources. He said,
‘I cannot visit the programme to provide guidance to the local coordinators as much as I need
to.’
Shortage of IT personnel. As noted earlier, most programmes lack IT support for the programme itself, tutors, and students. This lack of support means that computers are not fixed quickly when they are broken, that keeping up with maintenance on hardware and software is difficult, and that assistance for students and staff with computer problems is nonexistent. Performing maintenance often falls to the person on site who happens to have the most knowledge of computers.

IT personnel that did support programmes provided technical support and training to tutors, students, and programme personnel. But they reported that they could not keep up with all the work, and some felt they needed more technical training. Two IT staff said that sometimes they were not notified until computers had been broken for weeks. One programme had a single IT staff person dealing with hardware and software for more than 300 students.

At most sites, the one or two staff with the most computer skills and knowledge managed the server and assisted others with computer problems and issues as they arose. One programme manager said this was a difficult burden on top of his current workload. At some sites, because there were no IT personnel, the internet would not function well and would remain unavailable for months at a time.

9. Programme personnel are inadequately trained.

Although there is a pool of trained distance learning tutors in Tanzania, their number is small and does not adequately support the needs of the country's distance learning programmes. Not only is there a shortage of personnel to staff distance learning centres in Tanzania, but there is also a lack of training for existing personnel, as well as an inadequate number of personnel with specialised knowledge, experience, and skills in distance learning.

Lack of distance learning training for tutors. A group of 11 tutors was sent to the UK at the start of the CDE programme to gain skills in teaching distance learning programmes. They returned to Tanzania to train an additional 48 tutors for CDE programmes. One manager at an HTI stated that this core set of tutors did not go on to train additional tutors in the skills they had acquired abroad. He suggested that in the future, an expert distance learning trainer (perhaps from South Africa) should come to Tanzania to train groups of tutors. Some tutors and programme managers noted that because they were not trained in distance learning, they were not clear on how to orient students to the modality, nor were they adept at supporting students in their self-directed learning.

Lack of training for preceptors. One tutor stated that preceptors had not been well trained and did not know what the students were studying. It was suggested that preceptors should receive more training and guidance in their work to better support students. In one programme, students said preceptors were at the same level as they themselves and were unable to provide guidance or enhance their learning. These preceptors just ‘signed their papers’ (the papers the students needed to verify that they had gained skills in certain areas).

Preceptors themselves affirmed that they lacked training both in teaching distance learning courses and occasionally in the subject areas they were teaching. As one preceptor admitted, ‘I need more training in order to be better able to teach and monitor students, on both nursing subjects in general and on teaching.’ This same preceptor also stated that he needed a better orientation to the programme. Of all the preceptors interviewed, only one had received any substantial orientation on distance learning (2 weeks). The others had received either a few days of orientation or none at all. Preceptors repeatedly expressed a desire for courses in providing distance learning and for topic-specific refresher courses to keep them up to date on clinical knowledge and practice.
Lack of trained curriculum developers. While some programme representatives stated there are a number of curriculum developers in Tanzania developing high-quality training materials for distance learning programmes, others cited a shortage of such personnel. As a result, some programmes work with organizations from Germany or the UK to develop curriculum materials. Representatives of other programmes that offer computer-based instruction noted the difficulty of finding individuals who are trained in instructional design and have skills in structuring the learning of content through distance learning software technologies.

10. A disconnect exists between theory and the practical structure of some programmes.

While curricula for national distance learning programmes are based on Tanzanian national clinical guidelines and created for the Tanzanian context, other programmes use curricula or materials developed outside the country (in other parts of Africa and in Europe). According to students who use the latter, these curricula and materials lack grounding in the Tanzanian context. Referring to a curriculum that contained case studies from Uganda and Kenya, for example, one student noted that the case studies did not apply to her context because they lacked the diagnostic tests available in her clinic. She suggested, ‘If they [the programme] want us to learn to do these tests, we need to take a field trip to another hospital that has this test available so we can practice.’

Another student noted that materials developed outside the country contained information that conflicted with Tanzanian guidelines, although this report was contradicted by distance learning programme managers who said the materials were designed to meet national Tanzanian guidelines. One student said the clinical practicum should be better coordinated with the didactic component to address some of these issues. Students and programme staff in many of the distance learning programmes cited a lack of communication among curriculum developers, preceptors, and tutors that may contribute to a disconnect between the clinical and didactic components.

Preceptors stated that while students may leave the programme with clinical knowledge, their foundation in theory is lacking. As one preceptor said, ‘They are prepared by the clinical experience, but the big problem is the education on theory.’ Part of the challenge is related to the nature of the subject, requiring more discussion and face-to-face time than the programme structures allow. The issue of minimal classroom time frequently emerged in relation to inadequate coverage of theory in distance learning programmes. An MoHSW representative interviewed emphasised that time for mentoring needs to be allowed at the facilities where student practica take place and that there should be ‘a uniform plan for the practicum experience’ to ensure that health care standards are met.

11. Some curricula for national distance learning programmes are outdated.

Although the assessment teams attempted to collect distance learning curricula and training materials from every site visited, doing so was not possible. The shortages of materials discussed above are so severe that the sites lacked spare copies to give to the assessment teams. In the interviews, however, programme managers and tutors reported that some national programme curricula are in need of updating. The maternal and child health aide to enrolled nurse modules were developed in 1998 (at the time the programme was for maternal and child health aide to public health nurse B) but not approved by the Nursing Council until 2006. In the interim, in 1998 the public health nurse B curriculum was upgraded to an enrolled nurse curriculum by the MoHSW. There exists some content on HIV and AIDS, and TB in the national curricula, although it needs to be updated. Also, it was
noted that the distance learning curricula need to be aligned with the curricula of the corresponding resident programmes. For example, the clinical officer and clinical assistant pre-service training curricula were updated by the MoHSW this year, with several new topics added and additional materials for TB, HIV and AIDS, and TB/HIV. The clinical assistant to clinical officer distance learning upgrade programme has not updated its materials to align them with the new MoHSW curricula. As a result, the distance learning students will be at a disadvantage during their final exams, as well as in the clinical portion of their studies.

12. **Anecdotal evidence on traditional vs. distance learning students is mixed at this point.**

The three study centres visited (Kigoma CATC, Kilosa COTC, and Maswa CATC) vary with regard to student performance. Two study centres reported that distance learning students excelled more than traditional (residential) students. At Kigoma CATC, the student with the highest score on the clinical officer exam was a distance learning student. At Kilosa COTC, two distance learning students achieved the highest scores on particular portions of the exams. By contrast, in the first year of the programme at Maswa CATC, none of the distance learning students passed their exams until they had studied at the residential institute. Currently in this CATC, distance learning students are performing similarly to residential students.

In two other distance learning programmes, tutors noted that distance learning students’ performance was low overall and that this low performance, combined with poor English-language skills, caused ‘the weaker ones to sometimes drop out’. On the other hand, follow-up after interviews with the programme manager revealed that the first cohort of graduates from a nurse distance learning upgrade programme did far better on their MoHSW examinations than residential students. The programme manager suggested that an emphasis on the self-study portions of the programme and direction by distance learning tutors was the reason for this achievement. In a computer-based continuing education course designed by WHO for training in IMCI in Uganda and Kenya, participants were found to acquire knowledge more rapidly (and thus more cost-effectively) through computer-based than classroom-based training (Tavrow et al., 2002; QAP, 2006). The Tanzania WHO IMCI programme manager said she expects similar results from the upcoming pilot in Tanzania.

An issue paper from the USAID-funded Quality Assurance Project reviews current published and unpublished research on the use and effects of distance learning programmes for health care workers (Knebel, 2001). The paper cites numerous studies showing that distance learning programmes, regardless of the technology used to deliver content, are as effective as and occasionally more so than traditional training programmes on such measures as exam scores and on-the-job performance. The paper offers several caveats, however. One is that many of the studies had a weak design, especially with respect to random selection of the populations being compared. Other caveats included a lack of independent evaluation of traditional programmes and poor theoretical frameworks for judging the effectiveness of programmes. The paper cites many factors that impact students’ success in distance learning programmes, such as good programme leadership, training of tutors in distance learning, a sufficient amount of time allowed for studying, and adequate infrastructure and funding. Also, less status or prestige accorded to distance learning programmes can impact student motivation. Finally, several studies have shown that distance learning programmes have higher dropout rates than traditional, residential programmes, which impacts their cost-effectiveness and efficiency.

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Note that at the time of the site visits, Kigoma and Maswa were COTCs. They have since been changed to CATCs.
13. **More face-to-face and on-site time is desired.**

Students, tutors, and preceptors all said that more face-to-face sessions are needed. The lack of communication during the self-study portion of distance learning can leave students feeling isolated from tutors and classmates. Two students in one programme suggested that face-to-face sessions should be doubled. Another student said there should be a face-to-face session at the start of the programme and at specific intervals during the self-study component.

Managers and tutors at one HTI said, ‘Students don’t really learn until they come to the institute.’ When asked whether this was a function of distance learning as an instructional method or the structure of the programme, they replied that it was more the latter, but they stressed that face-to-face time is an essential part of health care worker training in distance learning programmes.

Preceptors likewise cited the need for more face-to-face class time. The issue frequently emerged in relation to insufficient coverage of theory in distance learning programmes, as discussed above.

![Face-to-face session in maternal and child health aide to enrolled nurse national upgrade programme in Morogoro](image)

14. **Barriers exist to integrating technology into programmes.**

As mentioned earlier, infrastructure barriers impede the integration of technology into distance learning programmes. These barriers include a lack of computer availability, inadequate bandwidth and slow speed to access the internet, lack of internet reach or coverage, and problems with electricity.

In addition, during the Second National Telemedicine Conference in Dar es Salaam in July 2008, participants stated that one barrier to the uptake of technology is a belief by clinicians that computers are for secretaries, and that some clinicians feel the technology is
being forced on them. Some FBOs have found that the uptake of telemedicine technology is especially low with older doctors as ‘they think computers are typewriters’.

Because students have little access to computers and the internet, some fail to see the importance of learning about them. One student said, ‘I don’t have an interest in learning about computers because I don’t think it is useful in my work.’ Another commented, ‘There is a computer in my village I can use, but I don’t use it because I don’t need it for my school or work.’

15. **Monitoring and evaluation plans are not in place for programmes.**

None of the upgrade programmes currently being implemented had monitoring and evaluation plans in place to assess students’ on-the-job performance after graduation. One programme is working with a university in the UK to develop a plan for using checklists and site visits to follow up with students and tutors. However, a lack of time and funding for tutors to perform this follow-up was cited as a potential barrier.

During courses, most upgrade programmes assess students through assignments and tests. At the completion of a programme, distance learning students must sit for the same MoHSW exams as resident students to receive certification.

Interviewed preceptors acknowledged that inadequate assessment methods are used in clinical rotations as well. In most programmes, assignments and exercise books are corrected and returned to the students and sometimes to the coordinators as well. Clinical practica are also assessed, although in most cases, this process appears to lack standardisation. In one course that appeared to be representative of many others, clinical areas are evaluated by the in-charge, who fills out a form stating that a student completed a particular area; the student then receives a percentage mark and sometimes a letter grade. According to the preceptor of this course, however, ‘This grade is not based on any competency checklist or anything really. It is just the subjective opinion of the person at the clinic or ward where the student is.’ Thus, the evaluation of students’ clinical performance is neither uniform nor consistent.

The issue of a strong monitoring and evaluation system in distance learning was of primary concern to the MoHSW representatives interviewed. As one interviewee said, ‘A team of people need to be monitoring the process to see that it is well undertaken. Monitoring and evaluation mechanisms need to be in place—don’t just proceed on and on without seeing if it is working.’
Technological Feasibility of Distance Learning in Tanzania

Many factors relating to the feasibility of distance learning in Tanzania are discussed in Chapter 5; this chapter focuses specifically on the critical and complex issue of technological feasibility. Determinants of the technological feasibility of using various media for distance learning programmes in Tanzania include access to the necessary resources, such as computers and internet services; access to the expertise or training needed to develop, implement, and maintain such programmes; and the country’s overall technological climate. This chapter examines these issues in turn with respect to print-based, computer-based, internet-based, and mobile technology–based distance learning. The overarching issue of the country’s electricity coverage is also addressed.

FEASIBILITY OF PRINT-BASED DISTANCE LEARNING

Print-based distance learning courses use printed materials as the primary medium for instruction, particularly the self-study portion. These materials include printed study modules, workbooks with assignments and tests, and books. All of the national programmes visited are primarily print based.

Print-based distance learning has been proven feasible in Tanzania and is operational now. It appears to be the most appropriate method for the country, especially given the constraints related to computer and internet access and use discussed below. On the other hand, as noted in Chapter 5, there are limitations to print-based distance learning in Tanzania. Primary among these is a lack of availability of the materials to students. Among the programmes visited, both institutions and students lacked sufficient supplies of printed materials because they could not afford to copy and mail them.

The CDE reported receiving insufficient financial support from the MoHSW for the mass production of modules for distribution to distance learners. Only one programme had materials on CD-ROM; however, these were for managers and tutors, not students, and were copied onto CD-ROM in Europe, not Tanzania.

Both cost and unreliability limit use of the postal service to transmit printed materials. Students said it was expensive to send items by registered mail. Likewise, the CDE cited a lack of funding to send materials to students via mail service. Another upgrade programme uses a courier service to send materials to students and can afford to send only a few books.
FEASIBILITY OF COMPUTER-BASED DISTANCE LEARNING

Some distance learning programmes for health care workers use computers as the principal medium for instruction, while others incorporate them as an integral element. The latter include some programmes that are primarily print based. Thus, it is important to consider the feasibility of computer use in any distance learning programme. Computer-based instruction may include the use of CD-ROMs; memory sticks; and electronic media such as DVDs, interactive slide presentations, and audio annotated animation. It may also encompass specialised software programmes that may or may not use the internet. It should be noted that, although computer- and internet-based distance learning are discussed separately in this chapter, the issues involved in the two types of programmes are cross-cutting.

Computer Access Issues

Estimates reveal that in 2006, less than 1 per cent of the population of Tanzania owned a personal computer (World Bank, 2006a). This figure translates into about 333,000 computer owners nationwide, based on the country’s 2006 population of 37 million, and represents about half the proportion for the sub-Saharan Africa region overall, which is 1.8 computers per 100 (World Bank, 2006a). A 2005 survey revealed that just 2 per cent of households located in Tanzania’s urban areas had at least one working computer (Wits, 2006). Only 15 per cent of these households were connected to the internet, and the vast majority of them (94 per cent) were located in Dar es Salaam. Personal computers are almost non-existent in rural homes (Furuhol and Kristiansen, 2007). While this survey is 3 years old, recent economic growth indicators suggest it is unlikely that major changes have occurred since then.

Given this scarcity of personal computers, most distance learning students must access computers outside the home for academic purposes. While computers were owned by most tutors and programme managers interviewed, this was the case for only one student interviewed.

Most students said they could access a computer, but there were constraints. As noted in Chapter 5, many reported that accessing a computer through the library or school was difficult or not an available option, and very few students said they used a computer at their work site (see the section on computer skills below). Internet cafés are the preferred means of computer access for distance learning students; however, there are constraints associated with this venue as well. There are no reliable statistics on the number of internet cafés in Tanzania; some sources put the total at about 300–400 (Furuhol and Kristiansen, 2007), while the Tanzania Ministry of Communications and Transport cites a number of more than 1,000 (Tanzania Ministry of Communications and Transport, 2003). Most cafés are located in the commercial centre of Dar es Salaam and in larger urban areas. Fees for their use are more or less standardised throughout the country, except for the most central and business-oriented areas in major Tanzanian cities and special tourist sites, such as Arusha and Zanzibar. The average price is TSH 1,000 (USD 0.83) per hour according to students interviewed and internet cafés visited by teams in the cities included in the assessment. At this price, students find internet cafés expensive, and they must also pay to ride a dalla dalla4 to get there. Many students said they take their hand-written papers to a secretarial service to be typed—often a requirement of programmes—which is also expensive.

Most computer labs observed at ZHRCs and HTIs contained at least one computer with access to a printer. At most institutions, however, programme managers, tutors, and students said they needed newer and better computers that would not continually be breaking down.

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4 Dalla dalla’s are mini-buses that serve as the main system of public transport in Tanzania.
They also said they needed more computers overall to alleviate a shortage that limited students' access to the equipment. Hours at most of the computer labs were limited as well, or in some cases were random and not posted. The rooms were all located in well-secured spaces, which were kept locked when not in use. Most labs had air conditioning, but some did not. Representatives of all programmes mentioned the lack of IT support to adequately maintain existing computers and to support students in their use (see the discussion of IT support in Chapter 5).

Health care workers surveyed for this study indicated that if they were to join a distance learning programme, they would need to have access to certain resources. These resources, mentioned by 35 per cent of participants, included computers, the internet, books/learning materials, and resource centres/libraries. One participant summed up these needs: ‘[To participate effectively in distance learning] a health care worker should be supported on the following: 1) learning materials, for example, books, handouts, 2) learning tools—computers with internet installed.’

**Computer Skill Issues**

Limited skills in the use of computers and the internet pose significant additional barriers for distance learning programmes. A report by The World Bank on ICT in Tanzania states, ‘ICT literacy will only become a reality when both individuals and organisations use ICT in their daily lives and when appropriate advanced training becomes available to those entering (and already in) the workforce’ (OTF Group, 2005).

Some programmes suggest that students enrol in a basic computer course before attending, and some provide training in computer skills. Regardless of whether such training is offered, however, most students interviewed said they needed more computer skills (also cited as a limitation for students by tutors). Most students described their computer skills as fairly basic. For example, they reported that they could open a Microsoft Word document, but most said they could not type well, and some not at all.

Tutors’ computer skills varied from basic to advanced. One tutor was in the process of developing an interactive case-based activity for a curriculum using a software programme that enabled the creation of computer-based self-study modules. On the other hand, some tutors reported using a computer rarely and having poor typing skills.

The surveys of health care workers conducted for this study further substantiate the high demand among this group for the acquisition of computer skills. For example, when asked which three topics they most needed to study for continuing education or short-course training, 35 per cent cited at least one computer-related topic. Of those that did not include computer training on their list, several mentioned it when asked whether they had ‘any other training needs’. Thus, the overall demand for computer skills among respondents was quite high.

In addition to measuring health care workers' demand for these skills, the surveys looked at the frequency with which respondents used a computer in their current job. Table 11 displays the results. More than half (54 per cent) of respondents said they used a computer in their job either weekly or daily—in the majority of cases for typing documents using Microsoft Word. Even those health care workers who used computers daily in their job cited a need for training in computer skills. Many of those who said they never used a computer in their work identified the same need.

It should be noted that WHO’s ICATT, described in Chapter 4, incorporates a computer skills component to be administered prior to the in-service training. The intent is to familiarise participants with the mouse and keyboard and use of the interactive study modules, as well as how to access resources within the programme.
**TABLE 11** Frequency with Which Health Care Workers Use a Computer in Their Job (n = 46)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>24</td>
</tr>
<tr>
<td>Once a month</td>
<td>15</td>
</tr>
<tr>
<td>Daily</td>
<td>17</td>
</tr>
<tr>
<td>Weekly</td>
<td>37</td>
</tr>
<tr>
<td>No response</td>
<td>7</td>
</tr>
</tbody>
</table>

**Hardware and Software Issues**

A lack of adequate hardware and software often creates problems for distance learning programmes in Tanzania. Many programme managers interviewed noted that open-source software was chosen when possible to keep costs down. At one institution, second-hand computers had been donated, but staff reported that this equipment would break within a few months to a couple of years and could not be fixed. Moreover, when computers are donated, a distance learning programme may not be able to request the number, type, and capabilities needed. One programme manager also noted that donated computers can have software incompatibility issues as they come with different applications.

**Need for Intensive Resource Inputs**

Interactive computer-based programmes require a large initial financial investment in programme design. These resource requirements may make development of such programmes infeasible on a national scale in Tanzania.

**FEASIBILITY OF INTERNET-BASED DISTANCE LEARNING**

As with computers, some distance learning programmes for health care workers use the internet as the primary medium for study, while others simply incorporate its use into print-based instruction—many programmes that are print or computer based require students to use and access the internet. Internet-based technologies used for distance learning for health care workers include both synchronous technologies, such as live virtual classroom environments, instant messaging chat, and video/audio web conferencing, and asynchronous technologies, such as chat boards, e-mail, web research, interactive web-based programmes, and downloadable audio and video files.

Currently, given the high costs of internet access and low internet penetration (see below), it may be difficult for students, especially in rural areas, to use the internet. It may also be challenging for institutions to fund internet services for distance learning students. Developments described below may alleviate these constraints in the next few years, making internet access faster and more widely available throughout the country.
Internet Penetration in Tanzania

The penetration of the internet in Africa differs by country. In terms of internet hosts and computers, Tanzania has one of the lowest usage rates in the region (OTF Group, 2005). Based on 2006 data, global penetration of the internet averaged 17 per cent, while in Europe and the Americas it was 37 per cent and in Africa 4 per cent; in Tanzania, penetration was just 1 per cent (see Figure 4) (ITU, 2006). The 2006 World Bank report referenced earlier indicates that the percentage of internet users in Tanzania is similar to the percentage who own a computer—1 per 100 population (World Bank, 2006a). This figure compares with 69 per 100 in the United States, 10.9 per 100 in South Africa, 7.6 per 100 in neighbouring Kenya, 8 per 100 in Benin, and 2.5 per 100 in Uganda (World Bank, 2006b). Important factors in the level of penetration include a country’s government policy, legal and regulatory frameworks, competition among internet service providers (ISPs), and pricing of telecommunications services, some of which are discussed separately below.

FIGURE 4 Internet penetration by region (per cent), 2006.
Despite low internet penetration, internet access and use have increased exponentially over the past few years in Tanzania. One study demonstrated an increase in numbers of internet users from 60,000 in 2000 to 333,000 in 2005, or 455 per cent (Furuholt and Kristiansen, 2007). Nonetheless, the number of internet users in the country remains very low. Most students interviewed reported that they did access the internet to support their studies. Indeed, in many programmes, students were expected to locate online resources. However, students frequently reported limitations in being able to meet this expectation, including the lack of skills noted above and slow service or limited connectivity when they were online. As with computer use generally, students cited internet cafés as the most common means used to access the internet.

In 2006, just 2 per cent of people in Tanzania had an e-mail address, and most of them lived in Dar es Salaam (Wits, 2006). When students were asked for their e-mail address, some reported that they did not know it. Others said they used e-mail to communicate with fellow students or tutors, but said they often did not choose to do so because ‘it took too much time’, meaning the connection was slow. Instead, many used a mobile phone to communicate with tutors and other students via SMS or voice.

Internet Infrastructure

The infrastructure required for the internet is limited in Tanzania. Internet connectivity in East Africa in general is sparse and expensive, and the quality is unpredictable. While countries in western, southern, and northern African countries are connected to submarine fibre optic cable systems that provide regional and intercontinental access, East Africa does not have these connections, so it gains internet access only via satellite. However, broadband connection via satellite is more expensive, has limited bandwidth capacity, and is subject to more transmission delays than broadband connection via fibre optic cable (OTF Group, 2005).

Figure 5 shows that large regions of Tanzania lack access to either high-speed fibre optic or satellite communications. Within the last few years, Tanzania Telecommunication Company LTD (TTCL), a government-licensed corporation, has installed landlines in many places not covered by high-speed connectivity. Until the national fibre optic backbone (discussed below) is complete, these landlines provide at least dial-up connectivity to the internet.

VSAT Installation at Lake Zonal Health Resource Centre, Mwanza
Fibre Optics

In the past, separate institutions—Tanzania Electrical Supply Company (TANESCO), TAZARA Railway, Tanzania Railways Corporation (TRC), and Songas—have owned and operated Tanzania’s existing fibre optic networks. Each institution created a separate infrastructure for fibre optics, resulting in an uncoordinated national ICT backbone. Recently, the Ministry of Communications and Transport and key telecommunications stakeholders have begun collaborating to create an ideal fibre optic and microwave network building on the current backbone shown in Figure 5; this ideal network is shown in Figure 6 (OTF Group, 2005). Analysts predict that by linking the networks of TANESCO, TAZARA, TRC, and Songas, Tanzania will have enough fibre to cover the country, and the network can then be linked to countries such as the Democratic Republic of Congo, Rwanda, and Burundi. At that time, videoconferencing and other wideband distance learning technologies with nationwide coverage are more likely to become feasible.

Several undersea fibre optic cable projects are under way in the East Africa region. The Eastern Africa Submarine Cable System (EASSy) should be complete in the next few years, and should lead to a reduction in the high cost of bandwidth for individuals and institutions in Tanzania. Nearly 10,000 km of high-capacity submarine fibre optic cable will link countries of East Africa, from South Africa to Djibouti, to each other and the rest of the world (see Figure 7). EASSy is considered a milestone in the development of information infrastructure in the region (Yonazi, 2005). Completion of the cable, slated for 2010, will mean that Tanzania will no longer have to rely on expensive satellite systems for voice and data services. SEACOM and TEAMS (The East African Marine System) are other fibre optic initiatives that will link East Africa to the rest of the world. These submarine fibre optic communications cables will complement Tanzania’s development of a national ICT backbone and help decrease the cost of connectivity within the country.
Broadband Wireless Services

Mobile-cellular technology is capable of providing fast wireless internet service in areas where cellular coverage exists but there are neither fibre nor microwave linkages. Wireless companies offer speeds ranging from general packet radio services (GPRS) (170 kilobits per second), to GPRS Edge (384 kilobits per second), up to 3G (2.4 megabits per second). This service is available today virtually anywhere a cell phone can be used. The cost is based upon the amount of information downloaded. Zain, one of the largest telecommunications companies in Tanzania, charges about TSH 200 (USD 0.15) for 1 megabyte. The service can be used to send and receive e-mail, to access web-based instruction, and to support low-end conferencing (such as Elluminate) and e-learning resources. This is an attractive option, especially in areas not covered by landlines or other connections.

FIGURE 7 Fibre optic cable being installed by the EASSy project.
NOTE: The EASSy fibre optic connection, shown in black, will connect the SAFE cable in southern Africa to the SEA ME WE cable in northern Africa.

ADSL and ISDN Lines

Another option for broadband communications is a leased line. Either asymmetric digital subscriber lines (ADSLs) or integrated services digital network (ISDN) lines can be rented from TTCL since these are essentially landline upgrades. The drawback is that these lines may not extend to all places, as illustrated in Figure 5. If available, however, these lines can support both broadband internet connections and high-end digital videoconferencing with more reliable audio and video quality because they provide a faster internet connection. However, the cost of this upgrade is even greater than that of very small aperture terminals (VSATs) (discussed below).

The Tanzania Global Development Learning Centre (TGDLC) is a global videoconferencing network. It offers services that can be leased by an organisation to support
distance learning, such as computer labs for e-learning and facilities for videoconferencing sessions. The videoconferencing service links to other global centres. Use of the TGDLC is expensive—about USD 200 per hour (TSH 269,000)—but the bandwidth provided allows for high-quality service. CD-ROMs for the training conducted through videoconferencing can also be created. The TGDLC, while not affordable for some organisations, serves as an example of the potential for high-quality videoconferencing in Tanzania should prices for internet services decrease in the future.

*Very Small Aperture Terminals (VSATs)*

To support high-performance internet communications, many rural communities, lacking other means of accessing the internet, have installed VSATs. Indeed, at most ZHRCs and HTIs visited outside Dar es Salaam, VSATs were being used for accessing internet services. In April 2008, the MoHSW, in conjunction with donors, installed VSATs in five ZHRCs (Lake, Southern, Central, Eastern, and Southwest Highlands) to provide internet connectivity (MoHSW, 2008). The installations were done by engineers from SatCom (a division of Soft Tech) and supervised by IT personnel from the MoHSW.

**Service Costs**

The cost of internet access in Tanzania is currently high as most broadband connections are provided via satellite, which is more expensive than fibre optic cable (OTF Group, 2005). The price basket\(^5\) for internet service per month is USD 36, compared with USD 15 per month in the United States, USD 11.60 in South Africa, and USD 15.80 in Kenya (World Bank, 2006b). Few sites visited had specific information on costs, although the MoHSW said that the cost of internet service for five ZHRCs in Tanzania, including initial installation costs, was USD 248,000 for the first year.\(^6\) It appears that communications costs in Tanzania are among the highest in Africa. One university-based distance learning programme located in Dar es Salaam pays USD 4,800 per month for an intermediate-speed internet connection (512,000 bits per second).

**FEASIBILITY OF MOBILE TELEPHONE–BASED DISTANCE LEARNING**

While the annual growth rate of mobile telephone users in Tanzania reached more than 100 per cent during 1997–2002, use of mobile and fixed telephones in Tanzania remains among the lowest in Africa (see Figure 8). Nonetheless, analysts project continued increases in mobile phone users.

Figure 9 shows that over the past several years, mobile telephone subscribers in Tanzania have risen from fewer than 1 user per 100 population in 2000 to nearly 15+ per 100 in 2006, while internet and computer access has remained largely constant: internet users rose from 0.1 per 100 in 2000 to 1 per 100 in 2006, and personal computer ownership from 0.3 per 100 to 0.9 per 100. However, it is estimated that about 25 per cent of the population in Tanzania is covered by mobile telephones (World Bank, 2006a). Interviews with students revealed that most owned a mobile phone and used it to communicate either by voice or SMS with classmates and tutors. One programme manager at an ICT organisation said that mobile

\(^5\) The price basket for internet service is calculated based on the cheapest available tariff for accessing the internet 20 hours a month (10 hours peak and 10 hours off-peak). The basket does not include telephone line rental but does include telephone usage charges if applicable. Data are compiled in the national currency and converted to U.S. dollars using the annual average exchange rate.

\(^6\) Interview with MoHSW, June 17, 2008.
phones are beginning to be used to send tests and quizzes to students and could potentially be used to send readings and other learning-related information.

NOTE: Lower income, lower middle income, upper middle income, and high income are defined according to The World Bank’s definition. Tanzania is defined as a lower income country: <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20421402−pagePK:64133150−piPK:64133175−theSitePK:239419,00.html#Low_income>

**FIGURE 9** ICT access indicators, 2000–2006.
NOTE: Lines representing personal computer and internet users are overlapping.
Presentations at the mHealth Workshop: Mobile Phone Applications for Public Health revealed that at least eight organisations are using mobile phones for the following: collection of community and clinical health data; delivery of health care information to practitioners, researchers, and patients; real-time monitoring of patients; and direct provision of care (telemedicine). Phones for Health is one organisation using mobile phones to strengthen health care systems, mainly through epidemiological tracking of disease surveillance data. The organisation coordinates the sending and receipt of large amounts of data at the national, regional, and local levels. Mobile phone technology appears to offer great potential for the training of health care workers, especially in the absence of computers and internet access for students.

**ELECTRICITY COVERAGE**

TANESCO serves fewer than 1 million clients out of a population of 37 million. Electricity coverage nationally is 10 per cent, but in most regions is in single digits. Rural coverage is less than 2 per cent (Lighting and Power Solutions, 2007). The reasons behind this low coverage include the limited reach of TANESCO’s grid and the low intensity of connections in the grid areas. Currently in Tanzania, industry, businesses, and households suffer from either a lack of or unreliable electrical service. Where electricity is available, the quality of the supply is poor, and blackouts and other service interruptions are common (Lighting and Power Solutions, 2007). The United States and other donor countries are engaged in several projects worth hundreds of millions dollars aimed at eliminating these deficiencies and developing new power stations (PwC, 2006).

When assessment teams arrived in Tanzania in mid-June 2008, Zanzibar was just recovering from a power outage that had lasted several weeks. During this time, distance learning students and MoHSW staff were unable to access computers. For students with few books, accessing research online is an important option. In Tanzania mainland, many ZHRC programme managers mentioned having back-up generators that allowed them to work for a few hours after a loss of electric power.

**CONCLUSION**

Given the financial constraints faced by distance learning programmes in Tanzania, emphasis should be placed on low-cost technologies and software. Print-based, computer-based, internet-based, and mobile phone–based distance learning modalities were examined for this assessment. Results indicate that print-based programmes are feasible, currently operational, and appropriate and effective for Tanzania. Constraints exist for this modality, however, including minimal availability of course materials for students, cost, and the unreliability of the postal service.

Computer- and internet-based distance learning programmes face more serious constraints. These relate primarily to students’ poor computer access and limited computer skills, the high cost and slow speed of internet access, inadequate infrastructure, and uneven and unreliable electricity coverage.

Although high-end digital videoconferencing is possible (at the TGDLC), its use is currently not feasible for most programmes given the cost of high-speed internet access. Low-end videoconferencing (through internet-based platforms such as Adobe Connect and Elluminate) may be feasible and is currently being piloted and implemented by the Zanzibar MoHSW and the CDE for use in the Aga Khan University enrolled nurse to registered nurse distance learning upgrade programme.
Mobile phone technology was found to offer increasing potential for training health care workers, especially in the absence of computers and internet access for students. Mobile phones are currently being used by an organisation in Tanzania to send tests and quizzes to students. Most students interviewed own mobile phones and use them to communicate with classmates and tutors.
The national CDE in Morogoro falls under the supervision of the MoHSW HRD’s Continuing Education Unit (CEU). ZHRCs and HTIs are identified as locations where distance learning students can have face-to-face meetings, do their practica, and take exams. Currently, HTIs are institutions for in-residence training of health care workers, including both pre-service training and in-service upgrade programmes, and some HTIs have also become study centres for CDE students. As discussed in Chapter 2, examples of HTIs include a COTC, an AMOTC, and an NTC. Most duties associated with managing current national distance learning programmes are the responsibility of the CDE, although ZHRCs and the CDE stated that decentralising coordination to the zones is preferred. The Northern ZHRC in Arusha, where CEDHA is located, coordinates its own distance learning programme (a diploma course for health district managers), but other ZHRCs and HTIs do not have distance learning programmes operating separately from the CDE’s programmes.

The role of the CDE is discussed in Chapters 2 and 4. The role of the ZHRCs is described in this chapter, including their capacity to conduct distance learning programmes and their past, current, or planned distance learning efforts.

Figure 10 illustrates the ideal organisational structure for Tanzania’s national distance learning programme under the HRD. Below the CDE are the ZHRCs and then the participating HTIs in each zone, which serve as study centres for distance learning students. While all the ZHRCs have responsibility on paper for distance learning activities, the Eastern ZHRC at Morogoro is ‘the first among equals’ because it houses the CDE, which controls the budget, the curricula, and the oversight for distance learning programmes throughout the country. Note that currently not all HTIs are involved in implementing national distance learning programmes.

OVERVIEW OF ZONAL HEALTH RESOURCE CENTRES

The MoHSW has established eight ZHRCs to facilitate upgrading of the skills of health care workers and to monitor the HTIs in their catchment areas. The ZHRCs serve as national centres for conducting health care worker training, coordinating pre-service training, in-service training, and continuing education in their respective zones. The three leading zones in terms of distance learning enrolment are Eastern, Lake, and Southern.
Interviews and site visits were conducted with four of the eight ZHRCs—Northern ZHRC in Arusha, Lake ZHRC in Mwanza, Eastern ZHRC in Morogoro, and Western ZHRC in Kigoma—as well as the Zanzibar CEU. The interviews revealed that most ZHRCs do not interface with the CDE on distance learning programmes aside from coordinating the proctoring of exams, although all ZHRC managers interviewed wished to take a larger role in programme coordination (with an increase in funding). Ideally, according to the CDE coordinator, ZHRCs could assist in recruiting students, monitoring student progress by marking assignments, distributing materials, conducting face-to-face sessions, and arranging and overseeing student practica.
FACTORS AFFECTING ZONAL HEALTH RESOURCE CENTRES’ CAPACITY TO CONDUCT DISTANCE LEARNING PROGRAMMES

The factors that most impact the ability of the ZHRCs to implement distance learning programmes are as follows (see also Chapter 5):

- Inadequate resources (financial and staffing) to meet the high demand for upgrading through distance learning
- Inadequate capacity of both ZHRCs and HTI study centres to implement distance learning and support students
- Inadequately trained distance learning tutors and preceptors
- Inadequate publicising of distance learning to various stakeholders in the zones, including employers at health care facilities

As the ZHRCs were receiving no funds from the MoHSW for conducting any of the national CDE distance learning programmes at the time of the site visits, they were not involved in distance learning efforts. Two exceptions are CEDHA in Arusha, which conducts a distance learning programme for Council Health Management Teams (CHMTs) with other zones, separate from the CDE, and Zanzibar CEU, which collaborates with the CDE and Aga Khan University for the enrolled nurse to registered nurse upgrade programme. Although the other ZHRCs are not directly involved in distance learning activities with the CDE, all managers interviewed expressed enthusiasm for conducting distance learning programmes and believed their region could benefit from expansion of these programmes. One ZHRC manager said, ‘Distance learning becomes necessary for us because we do not have enough space in our classrooms here.’ Other ZHRC coordinators said they thought distance learning could serve to train health care workers and qualify them for more advanced degrees. However, two coordinators suggested that distance learning was inappropriate for pre-service training of health care workers as they would need to both study and have experience in health care service delivery before they could be successful in a distance learning programme.

Site visits to the ZHRCs provided insight into the potential capacity of ZHRCs to conduct distance learning programmes. Information was gathered on IT personnel, equipment, and infrastructure at the four ZHRCs and Zanzibar CEU.

**IT Personnel**

None of the four ZHRCs visited had any designated IT personnel; Zanzibar CEU had two. According to the ZHRC coordinators, if an IT problem arose, they could request that an IT specialist from the MoHSW in Dar es Salaam travel to their facility to solve it. The IT burden at each ZHRC appeared to fall on those with the most knowledge and experience, even though these responsibilities were not a part of that person’s job description. A staff member from one ZHRC stated, ‘It can become a burden [on me] to fix the server, help people solve their problems with hardware and software and perform my normal job.’ CEDHA staff expressed the need for an IT staff person to build and maintain a website, troubleshoot IT problems, and manage the computer lab and resource centre computers.

In Zanzibar, the two IT staff noted that they were responsible for the entire Ministry of Health in Zanzibar, as well as the regional hospital, and that the amount of work could be overwhelming. One staff member in the CEU is trained in IT and developed a computer skills–based course to train health care workers at various MoHSW Resource Centres in Zanzibar.
At Lake ZHRC in Mwanza, one staff member said he was invited by the MoHSW to attend IT training. He said the goal of this training was to increase IT capacity in the ZHRCs by training one person elected by each ZHRC. This person was then supposed to train others at his/her institution and serve as an on-site resource for others on IT-related questions and issues. At the time of the interview, the staff member noted that he had not heard any more about the training in the past few months. Staff at Lake ZHRC expressed the desire for a trained IT person for their computer lab.

As noted, there are no designated IT staff at either Eastern or Western ZHRC. At Eastern ZHRC, a supply officer performs double duty managing his regular duties and overseeing IT operations.

### Computers and Internet Access

In February 2008, the MoHSW, in an effort to strengthen training capacity at the ZHRCs, provided internet connectivity to Lake, Southern, Central, Eastern, and Southwestern ZHRCs, as well as 10 computers each for all eight ZHRCs (MoHSW, 2008). Two technicians from the ministry, along with engineers from SatCom, installed a local area network (LAN) that included 20 data points and 20 voice points, and provided an internet link via VSAT as well as ICT equipment (10 desktop computers, two laptops, and an LCD projector for each site). The technicians faced significant challenges: there were no proper computer tables; most locations where computers were placed had no power taping points on the wall; the computer supplier failed to provide a Microsoft Office CD for installation on the ten desktop computers and two laptops; and the voice points could not be activated because the private automatic branch exchange (PABX) and voice switch had been overlooked when the equipment was provided. The ZHRCs promised to find a means of buying proper computer tables and to install power taping points. The supplier was asked to provide the installation media, and plans for installing the PABX and voice switch may be incorporated into the next budget. The installation team noted the lack of IT personnel, leaving the zones to deal with any technical problems themselves without sufficient support (MoHSW, 2008).

Although there was a range of technological resources and equipment to support distance learning among the ZHRCs visited, most had designated computer labs with internet capabilities in varying levels of operation. Of all the ZHRCs visited, CEDHA had the largest computer lab with 22 computers, all of which had access to the internet. One computer was connected to a printer. The lab was well secured, with a staff member overseeing its use, and was locked when not in use. The lab had air conditioning and adequate tables for the computers. There were also two computers in a resource library. Each of the 15 staff members, including tutors, had a computer with internet capabilities. Internet service was provided to CEDHA by a local NGO, although staff commented that the service was slow and bandwidth restricted. Large documents were difficult to download. Staff expressed the need for broadband internet service and more computers for students, as well as laptops, LCDs, projection screens, and flipcharts for on-site training.

Zanzibar CEU had a computer lab with ten computers. The room had air conditioning and was well secured, remaining locked when not in use. Students enrolled in the Aga Khan University programme did not mention using this lab, however.

Zanzibar CEU and district CECs are planning a computer lab with 40 workstations, to be staffed by a librarian who has received specialised training in a 2-year diploma programme in Bagamoyo.

District Health Resource Centres that are managed by the CECs have textbooks, journals, internet access, and one to five computers each (although most of the computers are old and in disrepair, with one staff member reporting that none of them were currently functioning).
The CEU would like to obtain a grant to re-stock the centres, but noted it is difficult to get grants to fund hardware.

Internet service was provided to the District Health Resource Centres and the Resource Centre at the College of Health Sciences by the Zanzibar Joint Ministries Internet Project (ZJMIP), supported by USAID and DANIDA, allowing them to have wireless service. Additionally, two centres (Mianzini and Kivunge) have a laptop, an LCD projector, a screen, polycom speakers, and a microphone, as well as a miniature solar panel, giving distance learning students access to live web-based sessions broadcast from Aga Khan University for the nurse upgrade programme. Distance learning students can also access computers and the internet at the Mianzini Zanzibar Town Resource Centre and Kivunge/North A District. The CEU hopes to recruit students from Pemba for the Aga Khan University nurse upgrade course and launch a Resource Centre in the Chake district of Pemba.

At the time of the site visit, Lake ZHRC in Mwanza had recently received 15 new Dell desktop computers and flat screens. They had been in boxes for 3 months in the middle of the designated computer room. Staff said the room needed air conditioning and computer tables before the computers could be installed, and there was currently no funding for this purpose. There were 15 electrical outlets and 15 internet ports for the new computers that had recently been installed. Internet connectivity was via VSAT. Eventually, health care workers who come to the institution for short-course training will use the computer lab. Currently, these students can go to the Bugando Medical Centre library to use the internet.

![Computer lab at Lake ZHRC. These computers had been in their boxes for 3 months as there were no funds to provide air conditioning for the lab or purchase computer tables.](image-url)
At Eastern ZHRC in Morogoro, there were 25 computers in a new computer lab. Internet access was provided via VSAT at a reported speed of approximately 40 kilobits per second. All computers appeared to be connected to the VSAT through a common switch, reducing the speed (bandwidth) accordingly. If some of the computers could be disconnected from the switch, higher internet speeds could be realised, perhaps enabling sophisticated webinars or even digital videoconferencing. The maximum bandwidth provided by the VSAT could be as high as $25 \times 40,000 = 1$ megabit.

Internet capability had not yet been implemented in Western ZHRC, Kigoma, at the time of the site visit, although a lab space had been identified, and ten computers had been in their packing crates for at least 2–3 months. The reason given for the slow progress was a lack of furniture for the lab. No VSAT had been installed in Kigoma, so the lab will have to rely on the local internet infrastructure available in the Western Zone. This infrastructure (and its connective speed) appeared to be adequate given the team’s observations at AHADI, a local NGO visited, as well as at local internet cafés and a local hotel. However, frequent and long-lasting electrical outages have occurred in this zone.

Overall, what appeared to be lacking at many of the sites visited was an imaginative approach to the development of programmes using the available capabilities and a strong interest on the part of the ZHRCs in beginning to use the technology. Although the remaining four ZHRCs were not visited during this assessment, the following information was collected from them:

- Southern Highlands ZHRC in Iringa has three computer labs—one for students and two for staff, visitors, and the public. The internet works at a fairly good speed, and Japan International Cooperation Agency has seconded an IT person.
- Southwestern ZHRC in Mbeya has a computer lab with about 20 computers, all connected to the internet, for use by students and staff of three schools. The new Centre for Infectious Disease on the ground of Mbeya Referral Hospital (where the ZHRC is supposed to move) also has a computer lab with about 15 to 20 internet-connected computers. Most of the staff of the three schools and the ZHRC have desktop computers, but very few of these computers are connected to the internet, so the staff use the computer lab or sometimes internet cafés. There is no IT person, but one of the tutors has a little IT knowledge and so helps out. There is a branch of Dar es Salaam University Computer Centre in Mbeya, where people can take classes.
- Central ZHRC in Dodoma has a very small computer lab and a rather slow internet connection. There is no IT person, but a tutor has been designated to help others.
- Southern ZHRC in Mtwara has a large computer lab and is building a second one. The internet connection is slow in the Mtwara region. The ZHRC offers computer classes to the community for a fee.

Physical Infrastructure

CEDHA has a resource library that appeared to be well stocked with books and materials, as well as with two computers. It was the only ZHRC visited that had a small print shop to produce training materials for its programmes, which was also used by the MoHSW, health care facilities in the zone, development partners, and training participants. The shop had three staff members, plus a secretary to perform typesetting. It had two offset presses, a knife trimmer, a guillotine, a stitching machine, a copy machine, a stencil machine, a spiral binder, a folder machine, a process camera, and a plate maker. The staff would like to upgrade the shop’s equipment and hire additional personnel so they can be a better resource to their
A staff member from CEDHA stated that there are plans to expand the computer lab and add other classrooms that could potentially be used for videoconferencing.

Zanzibar has several District Health Resource Centres, but as mentioned above, they are not well developed because of a lack of funding. The centres participate in the WHO HINARI (Health InterNetwork Access to Research) project, which enables developing countries to gain access to medical journals and health literature. The Resource Centre at the College of Health Sciences appears to be well developed.

Zanzibar CEU plans to strengthen its capacity by adding at least two classrooms that can be accessed by distance learning students for face-to-face sessions; a production unit for printing, photocopying, repackaging teaching and learning materials, and burning CDs and DVDs; a dark room and film editing suite; and an internet café. It plans to charge user fees and hopes to serve as a centre for developing and distributing materials to District Health Resource Centres (and to serve the same purpose for Unguja and Pemba). It is worth noting, however, that the proposed improvements to the Resource Centres and development of a production unit remain unfunded.

Lake ZHRC in Mwanza has ten staff—five academic and five support. It does not have a library, and resident students sometimes use the Bugando Medical Centre library located nearby. The centre has limited space and needs more for conducting on-site sessions.

Eastern ZHRC is located on the campus of the Morogoro Regional Hospital and collocated with the Morogoro PHN School. The ZHRC plays multiple roles: it provides training for public health nurses, it houses the national CDE, and it coordinates training for various vertical programmes initiated by both the government and development partners. Eastern ZHRC is collaborating with the CDE to coordinate and organise the distance learning activities currently taking place. The ZHRC provides a venue for face-to-face sessions, and ZHRC tutors participate in CDE tutorial sessions. One constraint mentioned by the coordinator is inadequate classroom space for the face-to-face sessions. There is a resource centre, but it lacks a librarian and materials for both students and tutors.

Western ZHRC in Kigoma provides a pre-service course for clinical assistants. The CATC that is collocated with the ZHRC has been conducting tutorial and practicum sessions for a very small number of students in the distance learning clinical assistant to clinical
officer upgrade programme. Western ZHRC also provides a venue for the final qualifying examination for distance learning students. Space for distance learning students—particularly classrooms and hostels—is a problem; the current rooms provide only enough space to house residential pre-service students. When distance learning students come for their practicum and tutorial sessions, the space is inadequate. In addition, the resource centre lacks materials and a specific individual to maintain it.

**PAST, CURRENT, OR PLANNED DISTANCE LEARNING EFFORTS BY THE ZONAL HEALTH RESOURCE CENTRES**

Besides the limited involvement of the ZHRCs in CDE activities discussed earlier, only CEDHA and Zanzibar CEU have additional experience with distance learning programmes.

**ZHRC E-collaboration Project**

This project was started by CEDHA in collaboration with the MoHSW and GTZ. The goal was to connect all ZHRCs across the network using an asynchronous online platform based on InWEnt’s Global Campus 21. ZHRC staff would then be able to use online communities to communicate about lessons learned and best practices in their daily work. CEDHA envisioned the MoHSW’s distributing assignments to the ZHRCs using this mechanism. The project was taken to all ZHRCs to demonstrate its capabilities, and it created a great deal of excitement in the ZHRCs. Nonetheless, it failed because it lacked widespread support, and people were not comfortable with the technology, so the platform did not see many users after the initial excitement. Some ZHRC staff interviewed said they believe staff need training in and familiarisation with technologies such as computers and the internet before those technologies will be adopted. One manager suggested that technology that requires users to access a website for asynchronous communication may not have been an appropriate choice for communication across zones when even e-mail communication is not yet dominant in the organisational culture. Indeed, many programme managers and tutors noted that the current culture of communication between zones involved using phone calls or in-person visits to collaborate. One reason in-person visits were attractive was that a per diem was given. Managers cited this as a concern for distance learning. They suggested that it may be necessary to provide a per diem for distance learning in-service participants as many health care workers rely on this money to supplement their salary.

**Northern ZHRC–CEDHA Diploma in District Health Management for Health Managers and Health Care Workers**

The District Health Management course, initiated in 2006, is 3 years in duration. It began with funding from DANIDA and also receives support from GTZ in Germany and from the MoHSW. There are currently 113 participants in four zones (Northern, Southern, Eastern, and Southern Highlands). The programme is managed centrally out of CEDHA, although more staff are needed for better coordination across the other zones. The course appeared to be very well organised. For example, it has a detailed structure, and a brochure outlines the programme components. Materials are print based and appear to be of high quality. They contain guidance for participants and facilitators on how to use the materials, slides, interactive activities, and worksheets, as well as printed references including journal articles and information from websites. The materials are developed in conjunction with GTZ and are printed in Germany. The coordinators in Arusha have received expressions of interest from
other zones that would like to enrol students in the programme, but they stated that it would be difficult to scale up without additional funding and staff.

**Zanzibar Efforts**

Zanzibar CEU participates in coordination of the Aga Khan University enrolled nurse to registered nurse distance learning programme by assisting with recruitment. Next year, Zanzibar CEU plans to take a larger role in coordinating the programme in Zanzibar in conjunction with the university, with the aim of improving the learning experience for Zanzibar students. The improvements are expected to enhance operational efficiency and cost savings as tutors from the university in Dar es Salaam will not have to travel, and facilities built at the Zanzibar MoHSW will be able to be used for other distance learning activities in Zanzibar. The improvements are expected to have the added benefit of increasing Zanzibar MoHSW CEU and IT staff members’ technical capacity to manage distance learning programmes. Zanzibar CEU is also hoping to establish an MoHSW high-capacity network, an online learning management system to track students/participants, and live collaboration applications (e.g., Elluminate, Moodle) that can be used for other learning purposes in the future.

Zanzibar CEU is beginning to gain experience in the use of different types of distance learning software. It has purchased licenses for Elluminate and conducted pilot tests. It has also started a web page for students in the CDE/Aga Khan University programme using Moodle, an asynchronous distance learning technology.

Zanzibar CEU is enthusiastic and hopeful about distance learning. It wants to revive a successful print-based community health nurse distance learning course that was halted 2 years ago because of funding issues, as well as expand the enrolled nurse to registered nurse upgrade programme to students in Pemba. The CEU would also like to create a distance learning programme for upgrading nurses to bachelor and master degrees.

**CONCLUSION**

Interviews revealed that most ZHRCs do not interface with the CDE on distance learning programmes, aside from coordinating the proctoring of exams. All ZHRC managers interviewed wished to take a larger role in assisting with programme coordination (given an increase in funding).

Factors identified that affect the ability of the ZHRCs to implement distance learning programmes include inadequate resources (financial and staffing) to meet the high demand for distance learning upgrade courses; inadequate financial support to ZHRCs and HTI study centres to implement distance learning, making them less effective in providing support to distance learning students; inadequately trained distance learning tutors and preceptors; and inadequate publicising of distance learning to various stakeholders in the zones, including employers at health care facilities. Despite the challenges that limit the involvement of the ZHRCs with the CDE in distance learning activities, interviews with managers revealed enthusiasm for conducting distance learning programmes and sentiments that their regions could benefit from expansion of these programmes.
Demand for Distance Learning for Health Care Workers in Tanzania and Potential Cadres to be Trained

Assessment results indicate that there is a substantial demand for distance learning programmes in Tanzania. In particular, feedback from students, programme managers, health care workers, and preceptors suggests that there is an urgent need to expand in-service distance learning programmes and possibly to develop pre-service distance learning programmes to combat the shortage of qualified health care workers. Results of focus group discussions also support this finding. As noted in Chapter 7, however, others suggested that distance learning is not appropriate for pre-service training because students need a stronger academic background and work experience before they can be successful in a distance learning programme.

DEMAND FOR UPGRADE PROGRAMMES

Many students currently participating in distance learning upgrade programmes said that after they graduated, they planned to gain advanced degrees through distance learning. This intent was expressed by a participant in the clinical assistant to clinical officer programme, as well as many students in the enrolled nurse to registered nurse programme.

Health care workers surveyed further substantiated the demand for distance learning programmes. Nearly all respondents (91 per cent) expressed interest in participating in such a programme if available in their region. Health care workers were also asked about their need for upgrade training. Fully 78 per cent stated that they needed to advance to a higher cadre. Of that 78 per cent, almost all (98 per cent) believed that distance learning could meet their need for upgrade training. The advancements most commonly mentioned were a master of public health (MPH) degree, a nursing degree (RN), and an assistant medical officer (AMO) advanced diploma.

DEMAND FOR SHORT-COURSE AND REFRESHER TRAINING, ESPECIALLY ON HIV AND AIDS

Results of focus group discussions, surveys of health care workers, and interviews with programme managers suggest that distance learning could play an important role in providing short courses or refresher training. This idea was frequently raised in the focus group discussions with representatives of organisations involved in training for HIV and AIDS care and treatment. Participants noted that different organisations often conduct training on the same topics for the same target audiences, but the materials used and information imparted can vary. They stressed the need for an integrated training package, particularly with respect to teaching about HIV and AIDS.

One participant noted that, in response to the provision of ART at the primary health care level, lower-level cadres are now being targeted for training in prevention of mother-to-child
transmission, TB, HIV, and voluntary counselling and testing: ‘All the partners are targeting them. Now they are just confused, and the training is not uniform.’ Several participants agreed that it would be better to have a comprehensive HIV-related training package. It was suggested that it might be possible to produce such a comprehensive training package to be distributed and conducted using distance learning methods, as with IMCI. One participant noted that if a modular HIV and AIDS course were created, health care workers could enrol in those sessions that were most relevant for them.

Some managers of ZHRCs said they would like to see short courses offered through distance learning for health care workers in their zones. Two managers noted that videoconferencing could be one way the zones could train health care workers through distance learning, but stressed that paying per diem would be important to encourage health care workers to attend.

Distance learning was also viewed as a feasible and effective method of conducting refresher training. This training could be used to review material already taught and/or update students on cutting-edge information, particularly for a topic such as HIV and AIDS that is subject to frequent changes. As an organisational representative stated, ‘Distance learning could be used for all the basic NACP [National AIDS Control Programme] courses we do. Distance learning would be great for refresher trainings; good for participants to review the information that was crammed into two weeks.’ One MoHSW respondent agreed, noting that distance learning could serve as an effective educational medium for refresher courses: ‘It could help us update many more health care workers with new knowledge.’

Surveyed health care workers indicated that they had a strong need for short courses and refresher training and that they were interested in distance learning as a means of receiving that training. As one respondent remarked about short-course distance learning programmes, ‘Distance learning can keep me up to date with any changes that have happened on revised curricula.’

Health care workers were asked to identify three topics for which they needed continuing education or short courses (see Table 12). The most common responses were computer training, HIV and AIDS–related training, health management/administration, and counselling skills.

**PRIORITY CADRES TO BE TRAINED**

Interviews with programme managers, tutors, and preceptors revealed enthusiasm for scaling up distance learning programmes to help meet the training demands of health care workers in all cadres. All interviewed preceptors believed that current distance learning programmes should be scaled up, and most concurred that the greatest need was to increase the number of upgrade programmes for nurses, specifically enrolled and registered nurses. Two tutors commented that distance learning upgrade programmes for enrolled nurses were a high priority ‘because this is the largest cadre of HCWs in Tanzania’. Interviews with a programme manager in Zanzibar revealed that Pemba had a great need for a distance learning programme for enrolled nurses since nurses on Pemba have never been given an opportunity to upgrade.

To expand distance learning activities, one preceptor suggested that distance learning programmes should go beyond their current focus on upgrade courses and work with nursing universities to target pre-service students so as to create a larger pool of trained health care workers. As noted above, however, some respondents stated that distance learning is not an appropriate modality for pre-service training.
An additional suggestion came from a preceptor who believed that the MoHSW needs to be proactive in responding to the demand for distance learning among health care workers: ‘The MoHSW is supposed to have a stronger distance learning programme coordinated through the country. If they want that to happen they should involve many stakeholders in the programme, like Health Training Institutions and universities. Concentrate on nurses and lower cadres of clinicians and involve districts and regions from all over the country.’

Participants in focus group discussions stressed that the lower-level cadres of health care workers found in primary care settings should be targeted for distance learning programmes because they tend to have less formal education and fewer opportunities to upgrade their qualifications. One focus group participant said, ‘The lower you go, the less trained the health care worker.’ Focus group participants agreed that nurse assistants and rural medical attendants should be priority groups to target for distance learning upgrade programmes: ‘They don’t have [the academic] qualifications to advance to higher institutions. This group could benefit from distance learning and then advance.’
Lessons Learned: Good Standard Practices Related to Distance Learning

This section outlines good standard practices related to distance learning that could be of benefit in strengthening distance learning programmes in Tanzania. These lessons learned were derived from a review of 49 global programmes, including site visits and interviews conducted in Tanzania. The review of global programmes included programmes within the I-TECH global network, universities in the United States conducting distance learning for health care workers, programmes in southern Africa, and global programmes of NGOs. These global programmes were selected for review because they had a strong international reputation for training health care workers through distance learning. Programmes in Africa and countries with contexts similar to that of Tanzania were given priority because of possible similarities in resources, infrastructure, and constraints.

1. **Distance learners need support and continuous monitoring.**

   Distance learning programmes have frequently been criticised on the grounds that their dropout rates are unacceptably high (Cherla and Magagula, 1999). Some programme managers interviewed commented that distance learning dropout rates tend to be high because as adult learners, participants may find it difficult to balance study time, family responsibilities, and work commitments. Although distance learners are often encouraged to be independent, self-reliant, and autonomous, they still need support and motivation from distance learning institutions, as well as from the workplace, family, and friends. Otherwise, a sense of isolation may set in.

   Student support mechanisms are crucial to the success of any distance learning programme. One important lesson learned is the value of building a learning community by connecting students with each other and tutors. Many programmes include face-to-face sessions at the outset to clarify mechanisms for communication during the self-study portion of the course or to create assignments in which students must work in groups during the self-study portion. The Caribbean Health Leadership Institute at the University of West Indies in Jamaica, for example, has a year-long course in management and leadership in which students are required to attend an on-site 3-day orientation. During this time, they are introduced to a mentor and are placed in ‘action teams’ to tackle problem-based assignments, and they present together during subsequent face-to-face sessions. In this way, the programme requires student interaction outside of face-to-face sessions.

   Distance learning institutions may also provide support by monitoring student progress and providing counselling as necessary. The Institute of Distance Education at the University of Swaziland, through its Learner Support Services Unit, continuously monitors the academic progress and attendance of students, and provides counselling to those who appear to be experiencing problems and are likely to drop out.

   In developed-country settings, many students have access to the internet and computers in their homes and can easily use online chat rooms and e-mail to communicate and receive
support. The situation is quite different in sub-Saharan Africa, however, where computer and internet access is limited. This assessment found that programmes that enabled students to work with other students in their area or district aided learning and reduced feelings of isolation. It is also imperative that programmes create opportunities for contact between students and tutors so that questions can be asked and answered, advice provided, and moral support given when needed. According to the interviews conducted, mail and mobile phones have been used as means for these interactions, as have study centres where students can meet teachers and tutors at mutually arranged times.

2. **Distance learning programmes require appropriate training materials.**

Curricular materials used in distance learning courses need to be designed and presented differently than in a face-to-face classroom situation; materials used in the latter settings cannot simply be re-packaged for use in a distance learning programme. Converting a conventional course to a distance learning format requires introducing complex concepts in carefully designed increments, providing sufficient information and guidance for self-study to be feasible and effective. Materials need to be readily available and understandable without a great deal of explanation from the tutor. Also needed are detailed competencies, course objectives, schedules for study, information on requirements, well-organised learning materials, clear instructions for their use, content relevant to students’ context, and references for further study.

3. **Tutors need specialised distance learning training before teaching in a distance learning programme.**

Distance learning instruction requires a specific set of skills. Rather than playing a ‘sage on stage’ role, facilitating most learning activities that take place in the classroom, tutors must serve as a ‘guide on the side’, playing more of a support role for the learner. To take on this role, tutors need specialised training in distance learning modalities, as well as in how to support and motivate distance learners. Many tutors also commented on the time commitment and flexibility in availability required to teach a distance learning course. As one programme manager/tutor stated: ‘A major advantage of distance learning to students is convenience; a major disadvantage to facilitators is inconvenience.’ This inconvenience is due to the significant amount of time tutors must often devote to monitoring students during their remote study and to providing them feedback during this portion of the training. Moreover, the duration of distance learning courses often does not correspond to the academic calendar, and tutors need to be available to learners year-round. A tutor might also teach a classroom-based version of a course and then be asked to create and teach a distance version. This request is frequently made without the offer of adequate compensation or respect for the extra effort required or the experience and skills needed to adapt the course. One tutor for an upgrade programme commented that if tutors were not told about the realities of the commitment, they might not serve the students well. Other tutors noted that there was a need to be well trained before teaching a distance learning course. Finally, in addition to training and orientation, tutors need adequate compensation.
4. **A blended approach that includes face-to-face instruction is crucial for any distance learning programme.**

In many training programmes, pure distance learning is not suitable for acquiring all necessary knowledge, attitudes, and skills. This is clearly the case for health care worker training that involves hospital or clinical practice. Students in distance learning programmes for health care workers need face-to-face sessions for practice-based, hands-on clinical learning, but also for the support and interaction that comes from meeting with other students and tutors in a classroom. It is important to incorporate face-to-face sessions at the beginning and end and at regular intervals during a course to give students a feeling of connection and to check on learning and provide feedback. One programme manager commented, ‘Distance learning is not a substitute for traditional learning; it enhances that classroom-based learning.’

Most successful distance learning programmes use a variety of media to teach content. Doing so makes programmes suitable for the range of learning styles that different students may have. One tutor said, ‘Using multiple learning methods [face-to-face, practical hands-on learning, self-study] in our programme increases learning by providing “something for everyone”.’

5. **Technology in and of itself is not sufficient for success; it should not have priority over the learning goals of the distance learning programme.**

In any distance learning programme, it is important first to identify the goals of the programme, and then examine whether and how technology can help meet those goals. If technology is put in place before the goals of the programme have been identified, the programme can fail.

One striking example of this lesson is the e-collaboration project discussed in Chapter 7, in which ZHRCs were given space on a website that allowed them to create chat boards under various topics. The staff at CEDHA who proposed the project were very enthusiastic about what the technology could do, so they devised a plan for how to use it to communicate across ZHRCs and with the MoHSW about best practices and to share questions and concerns about their work. The project was introduced to each ZHRC and created initial excitement, but in the end it failed. In an organisational culture where e-mail is not used routinely, it was a challenge for staff members to log on to a website to communicate with colleagues.

Another example comes from Namibia. A technologically advanced and expensive digital videoconferencing (DVC) system was purchased by the U.S. Government for Namibia, but the equipment lay dormant for years until the Ministry of Health and Social Services (MoHSS), along with several stakeholders, determined how an application could be created for its use in Namibia. Currently, I-TECH Namibia assists the MoHSS with operating the DVC system. The system is now used for many applications, including medical case conferences, virtual meetings to deliver information on new guidelines and protocols, and ‘film festivals’ building HIV and AIDS awareness.

Technology, though important in distance learning, is not the key element. Progressive teaching strategies and tactics, good learner support, and inspiring vision are more critical to success.
6. Technology appropriate to the particular setting is essential.

One of the major findings of this assessment was that computer and internet access was limited for students in Tanzania. Given these limitations, programmes aimed at health care workers need to provide students with access to computers to ensure successful learning experiences. Programmes also need to teach students and tutors computer skills, as well as to train and make available IT specialists who can support and sustain equipment and the skills of students and tutors. Even in print-based programmes, students can benefit from having access to materials electronically, as printed resources are extremely limited in Tanzania.

When programmes choose internet-based technologies for distance learning in sub-Saharan Africa, it is important to ensure that the technology can operate at a low bandwidth (36 kilobits per second or less). In one session of a live webinar, just opening the virtual classroom took 45 minutes; thus participants missed out on most of the session. Adobe Connect and Elluminate have been found to operate successfully at low bandwidths, although difficulties are still encountered. During a pilot test of Elluminate for use in the national distance learning programme, audio transmission failed to work well because of limited bandwidth.

Another potential drawback of Elluminate is having to download software prior to use. With a low-bandwidth connection, this could take a long time. One programme distributed CD-ROMs containing the presentations so it would not be necessary to download the materials with a slow connection. However, Elluminate does have features built in that can compensate for problems with low bandwidth. For example, Learning for International Non-Governmental Organisations (LINGOs), an organisation located in the United States and collaborating with international NGOs, uses Elluminate for its staff training programmes in developing countries around the world because it can be adapted to compensate for low bandwidth. If bandwidth causes an interruption in the live viewing, as is often the case even for software that works well at low bandwidth, the portion that was cut off is played at fast-forward speed until the viewers catch up to the presentation.

Funding for distance learning programmes is constrained in Tanzania; thus emphasis should be placed on low-cost technologies and software. One programme manager said, ‘We only use open-source software because it’s free.’ In some cases, organisations can receive discounts on software because they are an NGO. Another practical lesson is to use technologies that are simple and compatible on most computers. For web conferencing, for example, Adobe Connect uses Flash, a system that is on most computers, whereas Elluminate web conferencing uses a Java plug-in that must be downloaded before the system can be used.
7. **Distance learning should have strong centralised coordination, as well as strong local (decentralised) coordination.**

A key lesson learned is that providing responsive, dedicated, and centralised support across multiple sites is essential for the success of a distance learning programme. The I-TECH HIV/AIDS Clinical Seminar Series, a live webcast that broadcasts sessions on HIV and AIDS–related content to 17 countries, conducted a year-long evaluation of its programme. It was found that orienting sites, providing them with ongoing updates about the course, identifying a site coordinator, and responding promptly to technical difficulties were important to keeping sites interested and participating (University of Washington, 2008).

Interviews with the Open University of Tanzania and surveys of South African College for Open Learning (SACOL) and the University of Botswana have revealed that distance learning works best when it is distributed throughout a country, a region, or even a local area. It is important to make regional or local education centres available to students for face-to-face interactions, group study, downloading of information, internet searches, and duplication of materials. The presence of these study sites also plays a critical role in encouraging students by decreasing their sense of isolation and providing them a place to access much-needed resources.

Regional and local centres require investing in infrastructure for operations, as well as hiring individuals who can function as tutors at remote sites and provide any technical training needed by the students. The Open University of Tanzania, for example, has more than 30 such sites where at least one facilitator from each of its five major faculties is in residence.

8. **Partnerships can provide essential support and technical assistance for distance learning programmes in Tanzania and other parts of Africa.**

From the review of global programmes, it became clear that the most successful distance learning programmes have formed partnerships with development organisations having an interest or specialisation in distance learning. Ensuring that a distance learning programme has sufficient infrastructure and resources, such as a suitable number of competent tutors and other means of student support, is expensive and sometimes difficult to achieve. The
principle of creating partnerships and other forms of networking with other organisations is a sound one: synergies are created, economies of scale are achieved, and resources (both human and material, usually scarce) are optimised. Such partnerships have been observed at the AHADI Institute in Kigoma, Tanzania, where associations were formed with and certifications provided by European universities.

In fact, virtually every surveyed distance learning programme had some form of partnership with one or more international schools or other affiliations that provided some level of support. The national CDE at Morogoro had a working partnership with the University of London School of Distance Learning, where 11 facilitators were trained in 2000. CEDHA was working with the University of Leeds to strengthen the evaluation component of its diploma course for health district managers. One programme manager interviewed said that in his experience, he had found many experts in developed countries willing to offer specialised IT skills to ‘help Africa with ICT and distance learning’. He also mentioned that software companies sometimes granted his organisation licenses for expensive software that it would otherwise be unable to afford.

Mindset Network is a South African non-profit organisation that has formed partnerships across sectors of the South African government, including education, communication, and health. It provides educational content to schools, colleges, training institutions, workplaces, hospitals, and clinics in South Africa and 15 other African countries. It uses a blend of technologies, including video, computer-based multimedia, web and print content, and educational TV.

These affiliations and partnerships across sectors need to be strengthened even further and new partnerships developed if distance learning programmes in Tanzania are to be strengthened and scaled up.

9. **More staff with specialised skills are needed for distance learning programmes.**

In reviewing distance learning programmes at the University of South Africa (UNISA), SACOL, and the University of Swaziland, it became clear that special academic support staff are necessary to maintain a high-quality distance learning programme. For example, SACOL and the Open University of Tanzania each have an Instructional Design and Development Unit with responsibility for 1) coordinating the planning, design, and development of distance teaching/learning materials; 2) planning and coordinating training programmes in course design, development, delivery, and evaluation for academic course writers and course tutors; 3) participating in media selection for course delivery; and 4) editing, reviewing, supervising, monitoring, and evaluating the preparation of the distance learning/teaching materials of the course writers. Both schools also have a Printing and Production Unit that is responsible for coordinating the printing, production, and distribution of distance teaching/learning materials. For smaller distance learning programmes, course facilitators may have to handle all of these tasks and need special training.

If programmes include technology such as computers and the internet, IT experts are necessary to run the programme efficiently and prevent technological problems from impacting learning negatively. Consideration of how these specialised staff will be trained is important to ensuring the sustainability of a programme. Evangelical Lutheran Church in Tanzania (ELCT), an FBO conducting a telemedicine programme, reported that peer-to-peer technology training has worked well for this purpose. A nurse or doctor with technological skills is paired with an untrained colleague to serve as a guide in learning how to use the technology. The programme representative said that in this way, people can overcome their fears or apprehension about technology. Another approach mentioned was to train a
‘technology champion’ who is enthusiastic about the use of technology, and can promote it within the institution and teach others about it.

10. **When using technology, it is necessary to have a back-up plan.**

Programmes using web-based distance learning technologies and computer-based learning must ensure that there is a back-up plan in place should the technology malfunction, which it invariably will.

For web-based programmes such as the I-TECH HIV/AIDS Clinical Seminar Series, participating sites are asked to conduct a 20-minute site test with an IT specialist to troubleshoot connectivity issues before joining the series. Sites are also asked to log on half an hour before the session begins so that any audio problems can be fixed, and they will be ready when the seminar begins. Having asynchronous options for viewing the sessions—through streaming links, downloadable presentations, and copies of presentations on CD-ROM—enables participants to access sessions later when there is a poor internet connection. Providing slides and handouts in advance of a session allows participants to follow along if there are audio or visual problems during the seminar.

One distance learning programme, HIV [e]ducation, which provides a 3-month course in HIV for health care workers in Africa, gives participants flash disks with interactive content, assignments, and quizzes. When participants connect to the internet, the information automatically updates. The process for getting information onto the flash disks is expensive, and the technology is challenging. In one training session, flash disks were distributed to participants, but when plugged into the computers, they did not work. Programme representatives suggested that programmes using any technology ‘pilot, pilot, pilot, and pilot some more’.

11. **Videoconferencing applications can enable effective two-way interaction.**

Videoconferencing can support distance learning and also provide an important mechanism for two-way communication, including discussions, consultations, meetings, demonstrations, and telemedicine. Its drawbacks are the very high cost of the equipment and of bandwidth, particularly in Tanzania, as well as the need for technical experts to get the system up and running. On the other hand, although videoconferencing involves a large initial investment, it can be cost-effective in reducing travel and accommodation expenses for participants in training and meetings. As faster connections become available and decrease in price, high-end conferencing may become more feasible. Some inexpensive products, such as Elluminate and Adobe Connect Pro Live, are designed to operate with low-speed internet connections, but they do not offer as rich a forum for interaction as more expensive products.

In Namibia, I-TECH and CDC are collaborating with the Namibia MoHSS to manage the DVC programme previously mentioned. All Regional Health Training Centres, as well as several hospitals in Namibia, use the system for distance learning and for communication and meetings across the network. The Johns Hopkins University Centre for Clinical Global Health Education uses high-end videoconferencing in its clinical education programmes to broadcast grand rounds live to Ethiopia through the World Bank Videoconferencing Facility. It also broadcasts to two sites in India: Byramji Jeejeebhoy Medical College and the National AIDS Research Institute (NARI). These broadcasts include clinical demonstrations and even surgeries.
12. **Capacity and sustainability must be built into the programme.**

Any distance learning programme must be sustainable in terms of infrastructure, funding, and the capacity needed to operate the programme over time. Réseau en Afrique Francophone pour la Télémédecine (RAFT) is a teledermatology programme that broadcasts live webcasts of interactive courses and teleconsults targeting health care workers in 15 French African countries. The series began in Switzerland, and over the past several years has moved largely to being managed by the 15 countries themselves. One programme manager noted that shifting the capacity to manage the series from north–south to south–south is a key goal of the programme. One capacity-building activity was to offer local coordinators specific training for online content development, mainly through distance learning but also during face-to-face workshops. Currently, many new materials for the courses are initiated and produced by partners from the African countries themselves, and this aspect of the programme is increasing steadily. Presenters include experts in Africa and Europe, and content is structured as dialogue among several experts from different institutions in each region. RAFT also has a teledermatology project called Pluriderm. For this project, dermatologists are working on a knowledge base that represents the multiple diagnostic and therapeutic approaches of specialists from different countries and settings, as well as the approaches of traditional practitioners (Geissbuhler et al., 2007).

13. **Programmes should capitalise on free and low-cost resources available for distance learning.**

Given the resource constraints in Tanzania outlined in earlier chapters, it is important for organisations to capitalise on free resources that are available to distance learning programmes that train health care workers. Some programmes offer free online libraries and access to journals for learning institutions in Africa. Many free courses are also available, including both long and short self-study and blended learning programmes. One example is Global Campus 21 (http://gc21.inwent.org/en/index.jsp), operated by InWEnt at the GTZ office in Dar es Salaam, which offers e-learning programmes on HIV and AIDS–related topics, leadership and management, and education. In addition, various webcasts and self-study modules are available from the Johns Hopkins University Centre for Clinical Global

Another useful resource for distance learning programmes in Tanzania is a website that provides health care workers with information and resources in Kiswahili (www.afyamtandao.org). In addition, membership in LINGOs, while not free, provides programmes with several benefits. These include technical support from e-learning professionals; user licenses for several software packages related to distance learning technology; and unlimited access to online courses from LINGOs and Harvard and Cornell Universities. More information on LINGOs can be found in Appendix B.

14. **Evaluation systems should be in place to demonstrate whether and how programmes are effective.**

   Evaluation is essential to determine how effective a distance learning programme is, how distance learning students perform in relation to those in a corresponding residential programme, and how alumni are doing in their jobs. Knowing the skill areas in which alumni need support can help inform programme planners about what to include in the training. Evaluation and feedback for tutors are important as well.

   Evaluation can also help programme planners identify best practices and lessons learned so that existing programmes can be improved. The I-TECH HIV/AIDS Clinical Seminar Series, for example, conducted a programme evaluation that proved useful in determining how to orient tutors to the series (regarding voice and rate of speech and management of the chat box), yielded insight into why some sites were not participating (lack of a site coordinator with dedicated time, time zone problems), and revealed that the case-based interactive structure was effective for teaching participants. All of these results helped programme managers improve the programme and build on its existing strengths, as well as expand the effort to reach more sites and occur more frequently (University of Washington, 2008).

   Despite its well-recognised benefits, evaluation requires resources that may not be available. One programme representative said resources were insufficient to support evaluation of tutors; thus the programme sought outside funding for this purpose from a university in the UK.

15. **Political support for national distance learning programmes is necessary for scale-up.**

   The MoHSW recognised distance learning as an effective method that could be used to scale up the training of health care workers in Tanzania (MoHSW, 2007a). This political will led to the creation of a specialised centre for the development of distance learning programmes for health care workers—the CDE in Morogoro. The establishment of the CDE led in turn to the development of two national health care worker upgrade programmes that are coordinated with HTIs serving as study centres for the CDE. Building this capacity and infrastructure has resulted in a sustainable structure for distance learning for health care workers in Tanzania. This structure will remain sustainable if investments are continually made to improve programmes and infrastructure. Tanzania can serve as a model for other African countries attempting to integrate distance learning into their national ministry of health structures.
South Africa is another country that exemplifies a national commitment to distance learning. South Africa has implemented specialised training centres for distance learning, as well as collaborations with universities that have advanced distance learning programmes. Its experience demonstrates the importance of having an articulated national policy on distance learning, support for distance learning among the nation’s political leadership, and recognition of distance learning degrees by a national accreditation body. Also important are the availability of professionally trained staff to manage and teach the programme, the complementary use of different kinds of media, and the existence of follow-up and support programmes for students to reinforce learning.
Part III
Recommendations
Recommendations

The assessment results presented in Part II are the basis for the recommendations that follow. These recommendations are designed to respond to the urgent need to increase the number of health care workers in Tanzania and the ambitious goals of MMAM, which has as a target for all 10 years that ‘Morogoro Distance Learning Unit and eight ZHRCs [will be] strengthened, and distance learning capacity will be improved’ (MoHSW, 2007a). The recommendations are intended to build on the strengths and successes of current programmes. Six overarching recommendations are offered, each of which is broken down into a set of detailed actions in the following pages:

1. **Provide adequate funding and infrastructure to the national CDE in Morogoro so it can better coordinate distance learning activities in Tanzania.**

2. **Decentralise distance learning zonal coordination functions, programmatic roles and responsibilities, and learner support to the ZHRCs.**

3. **Provide adequate support to the HTIs working with the national distance learning programme as study centres and to the health care facilities that serve as practicum sites.**

4. **Enhance and expand existing distance learning programmes and the development of training materials.**

5. **Create new distance learning programmes to upgrade, motivate, expand, and retain current cadres of health care workers in Tanzania.**

6. **Form an advisory body of distance learning stakeholders to develop a strategic plan and vision for distance learning, develop new programmes, create materials, share resources, provide funding, and support distance learning activities in Tanzania.**
Recommendation 1: Provide adequate funding and infrastructure to the national CDE in Morogoro so it can better coordinate distance learning activities in Tanzania.

The actions included under this recommendation are related to adequately supporting the institutional capacity of the CDE so it can carry out its mandate from the MoHSW. Closely related to this recommendation are increasing the role of the ZHRCs in CDE activities and adequately supporting the study centres located at HTIs, addressed in recommendations 2 and 3, respectively.

Recommendation 1.1: Improve the physical infrastructure of the CDE.

The CDE serves as a hub for national distance learning activities, yet has only one room for its offices. It should have the capacity to hold on-site sessions for distance learners in the region, as well as to provide space where large training sessions can occur for purposes of coordinating staff, tutors, and preceptors from the zones, regions, and districts. Resources should be available for students when they attend face-to-face sessions, including study materials (books, journals, modules) and equipment (computers, internet access, and IT support). At a minimum, the following additional infrastructure is needed:

- Administrative offices to accommodate tutors, administrative staff, and support staff
- Classrooms, ideally three, capable of holding up to 40 students each for face-to-face sessions
- A Resource Centre Library for distance learning students
- A computer lab with internet capabilities and a printer
- Transport for administrative duties, supervision, and distribution of materials
- Staff to operate and maintain the new structures, such as cleaners, cooks, and askaris

Other infrastructure improvements that would enhance the CDE include:

- A large conference room for holding training that has the potential to be used for videoconferencing in the future
- A structure to house a Health Learning Materials Unit (see the description of this unit below)
- Hostels to accommodate up to 40 students during on-site sessions
- A cafeteria and kitchen, staff quarters, and lavatories
- A parking area

The MoHSW recently secured a 50-hectare tract of land that could be used to erect new infrastructure for the CDE and the Eastern ZHRC in Morogoro.
Recommendation 1.2: Increase human resources at the CDE.

a. **Increase the number of CDE personnel responsible for coordinating and supporting existing and new programmes.** The new administrative positions recommended below should be the top human resource priority for the CDE. Without adequate coordination, tutors and administrative staff at ZHRCs and HTIs and preceptors at clinical sites will not receive the support they need to keep the programmes functioning efficiently. Likewise, students enrolled in programmes will not receive proper support (such as consistent feedback, details about logistics, necessary services and information) to function well in the programmes. The current two staff positions should be reclassified as principal and assistant principal of the CDE. New staff should be hired to fill the positions of:
  - Zonal distance learning coordinator, responsible for linking with the ZHRCs
  - Study centre coordinator, responsible for linking with the HTIs
  - Practicum coordinator, responsible for linking with the clinical sites
  - Resource centre coordinator
  - Training materials development specialist
  - Faculty training coordinator
  - Accountant

b. **Increase the number of tutors and preceptors for national distance learning programmes.** If enrolment is to be increased, more tutors and preceptors will be necessary, particularly for programmes that already have shortages. Tutors and preceptors with relevant qualifications are needed to support learners in Morogoro Region as well as at ZHRCs and participating HTIs and health care facilities.

c. **Create a Distance Learning Training Unit.** This unit would consist of experts in distance learning instruction and programme operations. These experts would be available to orient, train, and retrain distance learning tutors, preceptors, and students that are or will be involved with national programmes. This unit could also provide technical assistance to HTIs or academic institutions that have or plan to launch distance learning programmes, as well as other national centres for distance learning in Africa.

d. **Hire at least one IT specialist.** This position would staff the proposed computer lab, support the IT needs of CDE staff, conduct necessary training, support HTIs as needed, and assist with training staff and students in IT-related skills.

e. **Create a Health Materials Development Unit.** This unit would be staffed with graphic designers, instructional designers, and support staff with technical skills in media and materials distribution. Its responsibilities would include coordinating with content experts on the development of curricular materials to support training programmes, transferring materials from printed to electronic format, and designing materials to publicise the CDE’s programme offerings.

Recommendation 1.3: Ensure adequate funding for the CDE and its activities.

a. **Ensure that budget allocations are in line with targets for the CDE.** In the past, the CDE has been expected to carry out all its national activities with only two staff members and no funding for decentralising its activities, supporting the ZHRCs and HTIs, and supporting preceptors. A realistic budget allocation is necessary that reflects what is really needed to produce the targeted number of competent graduates.
b. **Allow funds allocated for distance learning to support activities of ZHRCs and HTIs involved in distance learning programmes.** A funding mechanism should be established that allows distance learning funds to be directed to the zonal level to support the development of distance learning capacity in the ZHRCs and HTIs. Funds are necessary to support administrative staff, tutors, and preceptors at the ZHRC and HTI levels. (See Recommendations 2 and 3 for further detail.)

c. **Explore other options for funding distance learning activities.** The CDE is in need of major improvements. MoHSW funding may not be sufficient to achieve the goals set forth in MMAM, especially in light of the need to build capacity at the ZHRC and HTI levels. Grants and funding from partners both within and outside of Tanzania might be explored for the CDE, ZHRCs, and HTIs.

d. **Provide adequate compensation to attract, motivate, and retain preceptors and tutors.** Adequate compensation should be provided to preceptors and tutors to enable programmes to be sustainable. If the funds for this purpose are unavailable, other means of attracting, motivating, and retaining preceptors and tutors should be explored, such as providing opportunities for training, credentials, or other non-monetary benefits.

e. **Provide adequate financial support for students.** Students interviewed reported that even with tuition support, distance learning could be expensive. Options for decreasing costs for students include providing a stipend to cover a portion of expenses related to photocopying, secretarial services, printing, use of computers and the internet at internet cafés, and travel and accommodations for face-to-face sessions. Employers could also be encouraged to support their health care workers who are enrolled in distance learning upgrade programmes. Increased funding to programmes would allow them to provide students with hard copies of materials. In addition, the MoHSW could offer scholarships to students to cover these expenses. For internet and computer access, it may be possible for programmes to purchase these services for students from internet cafés at discounted rates. Students could be issued a card with an allotted number of hours of use. Use could be limited to off-peak hours, or certain hours could be reserved for distance learning students.

**Recommendation 1.4: Improve programme coordination.**

Programme coordination is key to creating distance learning programmes that serve students well and are sustainable.

a. **Bring together ZHRC and HTI distance learning coordinators on a semi-annual basis** to discuss challenges, share lessons learned, and plan for the future.

b. **Improve mechanisms for programmatic student support.** Provide students with responsive coordinators who can support and advocate for them and communicate their needs to programme managers. Ensure that students and tutors have contact details to maintain this communication and support.

c. **Create documents that detail the roles and responsibilities of tutors and preceptors.** Provide a responsive coordinator who can answer questions and support tutors and preceptors on programme-related concerns.

d. **Provide training and orientation to tutors and preceptors.** See Recommendation 4.1 for details.

e. **Build strong systems for feedback.** Improve the method for feedback between students and tutors. Institute a system for communicating feedback at regular intervals to create avenues for learning and discussion in particular areas in which students may
be struggling. Utilise mechanisms that work well for both students and tutors. For example, many students noted that internet access is limited and connections are slow, but that mobile phones work well. Based on their use for data collection and transmission in public health programmes, mobile phones hold strong potential for application in distance learning programmes. Protocols for communication between students and tutors and between students should be built into programmes and discussed at orientation.

f. **Encourage employers to support distance learning students.** As most students pursue a programme, their employers need to extend them much support and flexibility. Materials should be created that give employers information on how to extend this support, which may include allowing time off for face-to-face sessions and work with preceptors at other institutions or in another ward while ensuring adequate staffing in their absence. Programmes could also encourage employers to allow students to access computers at their job site for distance learning assignments.

g. **Improve monitoring and evaluation of programmes.** Improved methods of evaluation are necessary to demonstrate the effectiveness of programmes and to determine whether distance learning students are receiving the same education as resident students. Monitoring and evaluation methods should also be in place to ensure that tutors and preceptors are performing their responsibilities well. In addition, programme evaluations are needed to provide vital information on the quality of the curricula being used. Evaluation results can be used to improve distance learning instruction and materials. Alumni of these programmes and their employers should also be surveyed to determine whether the programme needs to be improved and whether the competencies taught are sufficient to meet the requirements for health care workers in the field.

**Recommendation 1.5: Develop a marketing plan that includes creation of a CDE website and printed materials.**

To increase enrolment, it is important to promote awareness of distance learning, the opportunities that exist, and programme entry requirements so students and employers understand the realities of distance learning and whether it is a feasible option for them. Brochures should be made available to prospective applicants and employers and distributed to health care facilities, HTIs, and ZHRCs. As a long-term goal, the CDE should create a website that would serve the dual purpose of giving potential students and employers information about the programme and of serving current students, who could use the website to access course information and materials.
**Recommendation 2: Decentralise distance learning zonal coordination functions, programmatic roles and responsibilities, and learner support to the ZHRCs.**

**Recommendation 2.1: Provide adequate funding to the ZHRCs to support their assumption of these responsibilities.**

Funding should be provided directly to the ZHRCs to implement CDE activities in the zones. A distance learning coordinator should be hired at each ZHRC to oversee recruitment, implement face-to-face sessions, provide learner support, coordinate study centres in the zone, negotiate and monitor practicum placements, and report to the CDE. Learner support should include monitoring and tracking students, ensuring consistent feedback and communication channels for students, and providing programmatic and instructional support as needed. The ZHRC could also hold regular meetings with distance learning stakeholders in the zone to share lessons learned, solve problems, and standardise programmes.

**Recommendation 2.2: Utilise computer labs and resource centres at the ZHRCs for distance learning activities.**

The ZHRC computer labs should be made available to distance learning students in the zones. Among other things, these labs could be used to conduct computer-based learning programmes, such as WHO’s ICATT programme, at the ZHRCs. During the course of the programme, participants could reside at the ZHRC.

**Recommendation 2.3: Allocate funding in ZHRC budgets to address IT needs for distance learning.**

Once ZHRCs have computer labs, they will need to ensure that the labs can be maintained. Each ZHRC should have at least one skilled IT specialist on staff and should create a line item in its annual budget for this position. The IT specialist should maintain the computer lab and also support staff who lack computer skills so they can use computers for their work. This specialist could also conduct computer skills training for faculty of the ZHRC and study centres that are involved in distance learning.

**Recommendation 2.4: Decrease costs for internet access at the ZHRCs.**

The MoHSW may be able to negotiate with TTCL for reduced tariffs, thus reducing communication costs for the ZHRCs. An alternative to costly VSATs for communicating across the ZHRCs would be the use of leased lines, an approach currently being used by the Ministry of Finance and the Bank of Tanzania to reduce expenses. The money saved on internet access could be used to build capacity for distance learning activities.
Recommendation 2.5: Reinstate CEDHA’s e-collaboration project among the ZHRCs, with leadership from the MoHSW and the CDE.

One way to ensure communication and collaboration among the ZHRCs for distance learning activities would be to reinstate the e-collaboration project initiated by CEDHA. An online platform would allow information to be shared and disseminated from the CDE to the ZHRCs and HTIs easily and quickly. Evaluation of the best technology for this purpose would be necessary; this evaluation should include gathering data from the MoHSW, CDE, ZHRCs, and HTIs to create buy-in to the programme. Synchronous, live communication (e.g., e-mail, instant messaging) may work better as a first step than an asynchronous platform (e.g., online chat boards and work groups). Training to familiarise ZHRC staff with the chosen technology(s) would be necessary initially, followed by continued training in computer and internet skills. Given its technological resources and skills in this area, CEDHA would be a good candidate to implement this recommendation.

Recommendation 2.6: Seek direct funding for distance learning activities from donors.

ZHRCs should seek direct funding from donors to increase their capacity to conduct distance learning programmes and meet the pressing needs in their zones. For example, CEDHA received funding from GTZ to launch a 3-year distance learning programme in its zone for district health managers. CEDHA now coordinates this programme in other zones.

Recommendation 2.7: Include Zanzibar in all of the CDE’s distance learning activities.

An agreement should be reached by the mainland and Zanzibar MoHSWs so that Zanzibar can implement the CDE’s distance learning programmes through its CEU and the Zanzibar College of Health Sciences. With its remote locations and USAID-funded computer/resource centres, Zanzibar is ideally suited to participating in these programmes.

Recommendation 3: Provide adequate support to the HTIs working with the national distance learning programme as study centres and to the health care facilities that serve as practicum sites.

This recommendation relates to the important role of HTIs and health care facilities in distance learning activities. While the following recommendations related to HTIs could be relevant to all HTIs in the future, there are currently eight COTCs (Musoma, Machema, Mvumi, Mafinga, Kilosa, Lindi, Masasi, and Mtwar), two CATCs (Maswa and Kigoma) and two NTCs (Morogoro PHN and Bagamoyo NTC) working with the national distance learning programme. Another HTI, the AMOTC at Ifakara, will be added when the clinical officer to assistant medical officer programme starts.
Recommendation 3.1: Provide adequate funding to increase the capacity of the HTI study centres to support distant learning students.

Funding should flow to the COTCs and NTCs currently serving as study centres for the national distance learning programme to support coordination; compensate tutors, preceptors, and managers; and assist with student-related expenses, such as accommodations, meals, modules, and additional learning materials and textbooks. In addition, these institutions should receive guidance on standardising roles/responsibilities and procedures related to programme operations and instruction. HTI staff involved in distance learning activities should receive training in distance learning methodologies (see recommendation 4.1 for detail).

Recommendation 3.2: Increase the number of HTIs acting as study centres for distance learning programmes.

If the CDE is to increase enrolment to train more health care workers, additional HTIs will need to be designated as study centres for these programmes. An assessment is needed to determine which HTIs are capable of taking on and coordinating these programmes. Once they have been identified, it will be important to ensure that the necessary infrastructure and staffing are in place to coordinate the programmes effectively and that staff are trained in distance learning methodologies.

Recommendation 4: Enhance and expand existing distance learning programmes and the development of training materials.

Given the challenges identified by those surveyed regarding existing upgrade programmes, it is important to enhance the structure and materials of current low-tech, print-based upgrade programmes creatively and effectively so students can benefit fully from distance learning in the near term. The following recommendations could be implemented as a collaborative effort of the CDE, the ZHRCs, and the HTIs.

Recommendation 4.1: Create standardised training and orientation packages for distance learning tutors and preceptors.

a. Develop a training package for distance learning tutors. This assessment identified the need to train tutors on how best to support students in a distance learning programme. There exists a pool of 59 tutors in Tanzania who have been trained in how to teach in a distance learning programme. These local experts could be tapped as trainers for distance learning tutors at ZHRCs and HTIs. The training content should include how to communicate with, support, and give feedback to students during the self-study portion of a programme; how to use face-to-face sessions effectively; how to structure learning; and how to encourage students to be self-motivated and be responsible for their own learning.

b. Provide distance learning tutors with a programme-specific orientation package. A standardised orientation package should be provided to tutors when they begin teaching in any distance learning programme. This orientation package should detail their roles and responsibilities, as well as their interactions with and the roles of other tutors, mentors, and preceptors in the programme and a detailed programme schedule. The package should also include information on expectations for communicating with and giving feedback to students, at what intervals, and using what mechanisms and
processes. This information is especially important in a low-tech distance learning programme, in which students may not have access to e-mail or other communication technologies and therefore may not reach out to tutors. In addition, tutors should be given required materials and instructions for facilitating face-to-face sessions and community field visits.

c. **Create a standardised training and orientation package for preceptors.**

Preceptors need training in their responsibilities, including how to clinically mentor distance learning students, how to interact with tutors, and how to give feedback to tutors and students about student performance. They should be informed about how to evaluate student competencies and how to fill out any special forms for describing student performance. The training should include content on how preceptors can best support distance learning students, for whom the preceptor may be the only individual in the community with whom they can interact face-to-face. Knowing when and how to communicate with the programme coordinators and tutors is important for providing feedback about student performance and calling attention to any areas in which a student may need special support in the theoretical/didactic or self-study portion of the training.

**Recommendation 4.2: Create an orientation package for students.**

Orientation packages for students should include a detailed schedule for the entire academic programme, with timelines and topics of study (a programme booklet); contact information for all students and tutors; guidance on how to be a self-motivated learner; and a list of resources to assist students both academically and personally. Students should receive clear guidance on expectations for the programme and their performance; how they will be evaluated and how feedback will be given and received; and what mechanisms and processes should be used to communicate with tutors, preceptors, and other students. Students should also be given guidance on balancing family, job, and academic responsibilities. They should receive information about possible additional costs (although ideally this information should be provided during the application process), as well as support services (i.e., tutors, student counsellors, or a programmatic point person) available to students. Such orientation packages are necessary for the three current national programmes and also should be a priority for any new programmes that will begin this year (this number is projected to be three, so a total of six packages would be needed).

**Recommendation 4.3: Develop a standardised computer training package for distance learning students and tutors.**

This training should be provided at the start of the programme and cover basic information about computers, such as how to use e-mail, how to use the internet, and how to access important online libraries and resources (e.g., free online journal databases), as well as an introduction to Microsoft Office. Given that students interviewed during this assessment reported that they lacked computer skills despite pre-programme training, refresher training should occur periodically for the duration of the programme, perhaps in conjunction with scheduled face-to-face sessions. The training should also include content that addresses attitudes, concerns, and fears regarding technology and computers. Content that would help students understand how a computer can be used in their job would also be useful.
Recommendation 4.4: Develop a training package in English-language skills.

Students should receive training to improve their English-language skills, especially in reading and writing, as most materials and all tests are in English, and students are required to write papers in English. An intensive course could be held prior to the start of their studies for students deemed to need additional English-language support. Throughout the programme, students should have the opportunity to improve their skills or receive special tutoring or support in English if needed. It may be possible to adapt training for English-language tutors or curricula for these courses from existing resources or programmes (for example, the Ministry of Education’s English-language training).

Recommendation 4.5: Strengthen distance learning curricula and training materials.

Based on feedback from students, tutors, and preceptors who are familiar with the curricula and materials, the following actions should be taken.

a. Ensure that curricula are appropriate to the Tanzanian context. Content, especially if developed outside the country, should be adapted to the Tanzanian context through use of a content review committee. This committee should ensure that examples, cases, and clinical guidelines used in the curricula are appropriate to the country.

b. Ensure that distance learning curricula and training materials are in line with their counterparts in residential programmes. For example, the clinical assistant and clinical officer curricula were revised by the MoHSW in 2007–2008, but the clinical assistant to clinical officer distance learning upgrade programme has yet to be revised accordingly. Distance learning students need to receive the same training as resident students, as they will be expected to pass the same exams and perform the same jobs.

c. Develop competencies and learning objectives for programmes. Competencies should be in place for programmes to guide both their theoretical and practical aspects. The effectiveness of student learning cannot be measured if competencies have not been identified. Competencies are especially important for clinical practica so preceptors can evaluate students and determine how to structure their learning. Preceptors and tutors can work together better if they know what theoretical and practical competencies are required. Learning objectives are necessary for each module to help students, tutors, and preceptors fulfill the goals of the programme and measure success in achieving those goals.

d. Develop a detailed timetable/schedule. Both students and tutors need to know when and for how long topics should be studied, when face-to-face sessions should occur and what they will cover, and when practica should commence. Instructions related to the timetable/schedule need to be clear so that students know how to pace themselves, as many programmes are self-paced.

e. Develop projects and activities that require students to work together. To decrease students’ feelings of isolation, projects that require them to work together and communicate regularly should be built into the programme.

f. Strengthen and update HIV, AIDS, TB, TB/HIV, malaria, and other important health content in distance learning curricula.
**Recommendation 4.6: Increase face-to-face sessions.**

In distance learning programmes using low-tech methods such as print-based media, it is especially important to ensure that sufficient face-to-face sessions are integrated into the programme. A face-to-face session at the start of the programme will help create an enduring learning community, and subsequent regularly scheduled face-to-face sessions will help students evaluate how they are doing, ask questions, and obtain feedback, as well as decrease feelings of isolation. A face-to-face session at the end of the programme can help programme managers and tutors obtain feedback from students about their experience in the programme and assist in identifying improvements for the following year, as well as help students reflect on their studies and receive support for the next phase of their career. How often face-to-face sessions occur depends on the extent to which students can interact with each other locally and where they need to travel for the sessions. Monthly sessions are ideal, but quarterly sessions may be more realistic. Providing travel allowances to students and tutors to attend/instruct such sessions may be a way to ensure that the sessions are made available and well attended. When travel is not feasible because of time and/or expense, delivering frequent interactive sessions via Elluminate or another low-end videoconferencing technology should be explored. The Aga Khan University nurse upgrade programme, for example, should ensure that internet-based live sessions that are substituted for face-to-face sessions are adequate to enable student learning.

**Recommendation 4.7: Increase students’ access to materials in Kiswahili to help reinforce learning.**

Since many students struggle with studying and taking tests and writing papers in English, giving them access to materials in Kiswahili would enhance and help reinforce learning. A website that gives health care workers information and resources in Kiswahili could be used for this purpose (www.afyamtandao.org). Programmes could make use of this resource and could also contribute to its expansion, or a national website could be developed to serve the need, with key resources and information being translated into Kiswahili. Other existing resources that have some information available in Kiswahili should be used in distance learning programmes, including WHO’s IMCI computer-based training.

**Recommendation 4.8: Ensure that students receive required materials in a timely manner.**

During the self-study portions of the programme, students need access to printed materials, as these are often their only learning resource. Programmes must ensure that students have access to materials by printing and distributing enough copies. Each student should receive a module. To cover costs, it may be necessary to ask students to pay an affordable share of this expense. Another way to address shortages of materials is to make them available electronically on CD-ROM, flash disk, and/or online for download on a CDE website. Several copies of the modules, as well as additional printed resource materials, should be made available to students in libraries/resource centres at the ZHRCs and local HTIs to supplement required modules. Use of TGDLC’s media facilities or (eventually) Zanzibar MoHISW’s media centre could be contracted to convert printed modules to CD-ROM, likely saving money over the cost of printing modules on paper.
Recommendation 4.9: If computers and internet access are required for students in the programme, ensure that they are available, accessible, and affordable.

Internet cafés were the number one means students reported using to access computers and the internet. Programmes could partner with internet cafés to purchase time for students to use their facilities and perhaps rent the facilities when conducting computer training for students. Internet cafés might be willing to allow students to use their facilities at a reduced cost if the programme were to purchase the time in advance. Linking students to ZHRCs and other institutions with computer labs is another option. If computers are available at the distance learning programme’s facility, IT personnel should be available to fix them when necessary so the equipment remains available for student use.

Recommendation 4.10: Consider building more advanced technologies into training programmes and materials.

Students could benefit from the use of technology to improve communication and collaboration with tutors and fellow classmates. Tools that could be used for this purpose include mobile phones; open-source software (no cost to the user); internet-based tools, such as software that enables instant messaging (e.g., Skype); and tools for asynchronous communication with multiple people, such as Moodle. An organisation that uses mobile phones to transmit data from the field to a centralised electronic system could be engaged to develop systems that would use this technology for administering tests and providing resources and important communications. This would enable students who have difficulty accessing computers and the internet to communicate and work electronically.

Recommendation 4.11: Prioritise particular cadres for distance learning.

Although shortages exist among all cadres, those in greatest need of upgrading are as follows:

- To meet the goals of MMAM, lower-level cadres that will be needed to staff primary care health facilities should be a priority. These include clinical officers, clinical assistants, and nurses. These cadres can also assist with providing HIV services at the local level.
- For nurses, upgrade programmes with the highest priority are those for registered nurses, enrolled nurses, theatre nurses, and community and public health nurses.
- Assistant medical officers are another high-priority cadre. The CDE is launching a clinical officer to assistant medical officer upgrade programme, but has been unable to complete curriculum development because of funding shortages. The University of Cardiff in the UK assisted in developing a module on STIs for this course, but has been unable to fund further modules.
Recommendation 5: Create new distance learning programmes to upgrade, motivate, expand, and retain current cadres of health care workers in Tanzania.

Once current distance learning programmes have been strengthened through the implementation of Recommendations 1–4, new initiatives will be needed to upgrade, motivate, expand, and retain health care workers in Tanzania.

Recommendation 5.1: Create distance learning short courses for use in continuing education for health care workers, and enlist the ZHRCs to conduct and coordinate these courses.

A specialised role for the ZHRCs in coordinating additional distance learning efforts should be established. This is an appropriate role as ZHRCs are already conducting these types of short courses for health care workers in person. Distance learning short courses could be 3 months in duration, with processes built in to allow for collaboration with classmates living nearby and communication and feedback from course tutors via e-mail or mobile phone—similar to courses offered by InWEnt’s Global Campus 21 programme. There should be a required face-to-face session at the beginning and end of the course and perhaps at a few intervals between, including one or more practicum components. Participants should be given printed and/or electronic materials on a thumb drive so they can engage in self-study between face-to-face sessions. Computer labs, resource centres/libraries, and training facilities at ZHRCs should be made available for face-to-face sessions and for regular use by students in the immediate area.

Results of the surveys of health care workers conducted for this assessment indicated that one of the greatest demands for short courses was on topics related to HIV and AIDS. These courses should be based on the standardised MoHSW training curriculum and provide content on updated medical information; prevention; counselling; prevention of mother-to-child transmission; care and treatment, including ARVs; and management of TB/HIV co-infection. Figure 11 illustrates locations with the highest percentage of HIV-positive pregnant women during 2002–2006, indicating areas where demand for training of health care workers in HIV and AIDS–related topics may be greatest. These areas could be targeted for piloting of continuing education distance learning training on these topics.

Another high-priority topic for the health care workers surveyed was health management/administration. Content on this topic could include leadership, programme management, and human resource management. CEDHA’s 3-year District Health Management course could be adapted to a shorter format that could be offered more widely to all health care workers in management positions. CEDHA’s experience and capacity in initiating and coordinating this programme would be a valuable asset in the adaptation of this course.
Recommendation 5.2: Expand existing programmes and develop additional in-service upgrade programmes, giving priority to cadres that will help the MoHSW reach the MMAM goals.

Assessment results indicate a high demand for upgrade programmes for health care workers. Health care workers who can staff facilities at the primary care level are of particular importance to the goals of MMAM. Thus, expanding existing upgrade programmes to produce more enrolled nurses, clinical assistants, and clinical officers is a priority. Also, developing new programmes to upgrade health assistants to health officers and pharmacy assistants to pharmacy technicians would ensure adequate skill mixes and levels of expertise in health centres and dispensaries. In addition, transferring students currently in residential in-service upgrade programmes to distance learning programmes and converting those facilities to pre-service training institutions would increase the numbers of new health care workers the HTIs can produce.
Recommendation 5.3: Pilot low-end technologies that provide synchronous two-way interaction and communication for students and the ZHRCs.

As fibre optic cables are introduced to Tanzania and the cost of internet access declines, videoconferencing may become a more realistic option. In the meantime, the use of lower-end videoconferencing technologies and other, free online two-way means of interacting should be piloted to determine whether they can meet the needs of distance learning students and the ZHRCs to interact and communicate. These methods could be used for conferencing among doctors located at hospitals near the ZHRCs; for meetings, conferences, and interviews between ZHRCs; and for classroom-based instruction in distance learning programmes. A number of low-end conferencing tools function well in low-bandwidth networks (Elluminate and Adobe Connect Pro Live, for example) and could be used for this purpose. A small pilot programme could be implemented, at low risk, to test the technology’s feasibility. Perhaps only three or four progressive ZHRCs might be involved initially, with subsequent expansion to other sites.

Tanzania Global Development Learning Centre in Dar es Salaam does provide the capability for digital videoconferencing with other global videoconference centres around the world. Although extremely expensive, high-end videoconferencing is possible, but it is not recommended for use by distance learning programmes on a national scale.

Recommendation 5.4: Use and integrate free, existing distance learning resources and training materials to create new programmes or enhance curricula of current programmes.

Free online resources are available that could be incorporated into the curricula of national programmes, used as stand-alone materials for continuing education courses coordinated by the ZHRCs, used as a resource by any distance learning programme in the country, or offered by the CDE on its website for all health care workers interested in expanding their knowledge base. One example is the WHO IMCI computer-based training course for Tanzania. Others include e-learning courses from WHO, Global Campus 21, and Johns Hopkins Global Health E-learning Centre. Live, free webcasts are also available from the I-TECH HIV/AIDS Clinical Seminar Series, Harvard University’s HIV Online Provider Education (HOPE) Project, and the Johns Hopkins University Centre for Clinical Global Health Education. Free open-source software, such as Moodle (asynchronous interaction), iPath (for telemedicine), and Skype, is also available for use in distance learning programmes. Free websites such as the University of San Francisco’s HIV InSite (http://hivinsite.ucsf.edu/) and Johns Hopkins’ AIDS Service Website (http://hopkins-aids.edu/) provide access to information, journals, presentations, and interactive case libraries that can be used by students. Portions of these websites can be downloaded to computers or PDAs for use offline.

Recommendation 5.5: Create and pilot a distance learning component for use in pre-service training.

Presently, all pre-service training is conducted through residential programmes. To increase the overall number of workers in the health care system, more people must be recruited for pre-service training. Incorporating a distance learning component into such training could help increase these numbers and alleviate the burden of growing enrolment on residential programmes.
A model that blends traditional resident training with distance learning could be considered. The first year of study could be conducted as a regular residential programme, with extra support and instruction to prepare students for the switch to distance learning in subsequent years of study. Distance learning could then combine self-study with an apprentice or trainee programme using local health care workers trained in this type of unique mentoring relationship. The trainee could begin the apprenticeship by working in either a health centre or a dispensary. A small stipend could be provided, which might increase as the trainee demonstrated competence and accumulated experience through his/her daily work. This hands-on exposure to health centre or dispensary operation would be augmented through didactic self-study and face-to-face sessions at regular intervals, perhaps when resident pre-service students were off-site. The programme could recruit candidates from the areas where the mentorships would take place, who would most likely remain in those areas after finishing their training.

As noted above, existing programmes should be strengthened before resources are dedicated to the development of new distance learning programmes. Moreover, any such pre-service distance learning programme should be piloted and evaluated before scale-up. If successful, this approach would improve the sustainability of local health centres and dispensaries by making it possible to attain adequate staffing.

Recommendation 6: Form an advisory body of distance learning stakeholders to develop a strategic plan and vision for distance learning, develop new programmes, create materials, share resources, provide funding, and support distance learning activities in Tanzania.

Recommendation 6.1: The MoHSW and the CDE should bring together a group of distance learning stakeholders as well as interested donors to create a strategic plan and vision to support distance learning in Tanzania.

The MoHSW and the CDE should take the lead in forming a group of distance learning stakeholders to serve as an advisory body on distance learning activities in Tanzania. This body could share experiences and resources to maximise the existing successes of distance learning nationwide. An initial meeting should be held to develop terms of reference and a plan for how the group will help advance distance learning in Tanzania. Subsequently, this body should meet quarterly to review progress, discuss challenges, share solutions and resources, create new programmes, and collaborate on materials and curricula.

Recommendation 6.2: Collaborate with major resource centres, e-learning centres, ZHRC computer labs, community-based telecentres, and distance learning programmes to share resources.

Given the limited resources that the CDE, ZHRCs, and HTIs have to conduct distance learning programmes and support distance learning students, sharing resources among organisations would help minimise costs and enhance the ability to provide additional resources to students in more areas of the country. Part II of this report details current and planned resource centres, computer centres, and e-learning centres. National programmes could collaborate with these centres to allow students in the area to study, use computers to access the internet, engage in e-learning or communicate with others in their programme, use available learning resources, meet with other students/tutors, meet for face-to-face sessions, and access other distance learning resources.
CEDHA in particular has a model resource centre, and one of its aims is to advise other ZHRCs on how to develop their libraries and resource centres. CEDHA staff could provide technical assistance to distance learning programmes, both national and local, on how to develop computerised databases; how to use ICT appropriately for communication and learning; and how to develop a resource centre, including identifying materials, reaching health care workers with those materials, and conducting assessments to ensure that materials are used effectively.

**Recommendation 6.3: Build more partnerships with training organisations and academic institutions to improve curricular materials and the monitoring and evaluation of distance learning programmes.**

Current partnerships exist that provide support in these areas, such as CDE’s partnerships with the University of London and Cardiff University, but more are necessary given the great need for programmatic improvements. Both national and international organisations and institutions specialising in curriculum development, training, and distance learning could help fill the gaps in funding and capacity building for national distance learning programmes in Tanzania. As was found in this assessment, many organisations both in Tanzania and globally have various capacities in operating and developing materials for distance learning programmes. Collaborating partners identified include InWent, Muhimbili, TGDLC, D-Tree International, LINGOs, AMREF, I-TECH, and Mindset, among others. The proposed advisory body should bring these organisations together with the national CDE to assist in capacity building in these areas.

**Some Final Words**

Tanzania has a surprising wealth of distance learning activities, some that are well established and some that are in the early stages of development. This assessment has attempted to capture the best practices of these programmes, as well as to paint a realistic picture of the challenges they face. Many recommendations have been offered, ranging from those that can be implemented immediately to those that will take long-term planning. Implementation of these recommendations will require vision and commitment, as well as a spirit of collaboration and cooperation among stakeholders.

Given the limited resources available in Tanzania, these recommendations will need to be prioritised. Indeed, this should be the first job of the advisory board proposed under Recommendation 6. The authors of this report recommend that the initial focus be on strengthening CDE, ZHRC, and HTI resources to support current distance learning programmes before new programmes are developed.
References


Appendix A
Assessment Tools
Assessment Tools

This appendix presents the tools that were developed for this distance learning assessment and for subsequent data collection:

- Introduction Script for the Distance Learning Assessment
- Programme Manager Questionnaire
- Instructor Questionnaire
- Participant Questionnaire
- IT Specialist Questionnaire
- Preceptor Questionnaire
- Daily Summary Form
- Interview Guide for Health Decision Makers
- Health Care Worker Survey
- Focus Group Discussion Guide: Training Partners
- Observation Tool: Live Session
**Instructions:** Read this script to the interviewee prior to the interview.

“We are conducting an assessment of distance learning programmes in Tanzania; this is a collaboration between the Ministry of Health, CDC and I-TECH.

We will be interviewing you today about your programme to gain information on achievements and challenges of distance learning programmes in Tanzania. We are aiming to determine the feasibility of distance learning, including Digital Video Conferencing, a type of distance learning modality. We’re also assessing the demand for distance learning in Tanzania.

This interview is voluntary. Your participation will help us better understand how distance learning activities are being implemented in Tanzania. You can choose not to discuss any topic during the interview. You can also choose to leave the discussion at any time for any reason.

In writing up the report we would like to feature successes and challenges of different distance learning activities in Tanzania. In doing this it will be necessary to identify your distance learning programme within our report. However, if there is any information that you would like us not to share, please let us know during the interview, and we will keep that information confidential.

Do you consent to this interview?”
I-TECH Tanzania Distance Learning Assessment
Programme Manager Questionnaire

**Target:** Programme managers/coordinators/managers

**Length:** 60 minutes

**Interviewer name:**

**Date:**

Do not ask if we already have this information!

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**Use the Introductory Script before conducting this interview**

1. What are the current distance learning or e-learning activity(s) in your programme? (Goals? When it was started? Face-to-face sessions? Practicum sessions? Methodologies? Content areas? With whom do you partner?)

2. What is your role in supporting these distance learning (DL) or e-learning activity(s)?

3. How many participants are involved in the distance learning or e-learning activity(s)? Backgrounds? How are they recruited selected? How many graduate? What are criteria for entering the school? How many drop out? Tuition cost? Their computer skills?


5. What type of platforms, media or technology do you use to support your academic goals? (i.e., print, e-learning, computer-based, DVC, internet-based, telecommunications) Any technological problems or issues? Is there training for participants/facilitators on these?

6. What materials do you use in your distance learning or e-learning activities? What processes do you use in preparing the materials? Who is involved in the process?

7. What are advantages/disadvantages in your distance learning activity? What are your challenges? What are some constraints that keep you from achieving your academic goals (technological, financial constraints, training issues? Drop out rate?)? What strategies do use for overcoming the challenges?

8. Describe the major achievements of your distance learning or e-learning activity(s)?

9. How do you evaluate participants? What are your findings?

10. How is your distance learning or e-learning activity specifically addressing HCW shortages? Examples?

11. What is your vision for future growth of the distance learning activity? Potential cadres that can benefit?

12. Do you have any materials you could give us with information about this distance learning activity? (Marketing materials, curriculum materials, website address, reports, etc.)

13. What are your suggestions for improving the distance education from the facilitator’s point of view and participant’s? How should it be organized/implemented? Management?

14. Other comments?
I-TECH Tanzania Distance Learning Assessment
Instructor Questionnaire

**Use the Introductory Script before conducting this interview**

1. What distance learning courses do you facilitate? How is it structured? Face-to-face?
2. What is your background in teaching in a distance learning environment? How did you get into it?
   Training for this position? How long have you been teaching?
3. What are the advantages/disadvantages of the distance learning activity? Challenges? What strategies do use for overcoming the challenges? What are the constraints in using distance learning? Ways it works well?
4. What methods do you use to teach through distance learning? (i.e., cases, simulations, lecture, etc.)
5. What materials do you use? Advantages/disadvantages? How are they developed?
6. What is your experience using the computer (and programmes) to facilitate/teach distance learning? What computer skills would enhance your ability to train in a distance learning environment? Are you satisfied with the technical support that the program supplies? Where do you access computers? Is training required to teach?
7. Describe the major achievements of your distance learning activity?
8. How are participants evaluated (i.e., tests, projects, skills)? Do you feel participants are adequately prepared upon completion of the course? Why or why not? How do you track former students? What are former students doing?
9. How could this distance learning activity be improved?
10. What is your vision for future growth of distance learning? Potential cadres that can benefit?
11. Any other comments?
I-TECH Tanzania Distance Learning Assessment
Participant Questionnaire

Target: Programme managers/coordinators/managers
Length: 30–45 minutes
Interviewer name:
Date:

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<td>Cadre (i.e. nurse, physician):</td>
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<td>Name of course:</td>
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**Use the Introductory Script before conducting this interview**

1. What distance learning or e-learning activity(s) do you take part in? How long have you attended?
2. How well do you think you learn through distance learning or e-learning?
   Advantages/Disadvantages of distance learning? Why did you choose distance learning?
   Challenges? What strategies do use for overcoming the challenges?
3. Do you find that the materials or equipment are adequate for your needs? Which are supplied to you? Problems/issues? Cost?
4. How do you interact with the facilitator—email, phone? Do you find that you have an adequate relationship? Challenges? What strategies do you use for overcoming the challenges?
5. How do you collaborate with other participants? How do you interact? Challenges? What strategies do you use for overcoming the challenges?
6. How do you express your opinions about the training to facilitators? How do you give feedback about the course to facilitators?
7. What is your experience using the computer (and programmes) in this distance learning activity?
   What computer skills would enhance your learning in distance learning? What skills? Are you satisfied with the technical support that the program supplies? Where do you access computers?
8. How would improve the distance learning or e-learning activity? Changes in current one?
9. How do plan to put to use your new skills, knowledge and degrees/certificates gained in this distance learning or e-learning activity(s)?
10. Any other comments?
**Use the Introductory Script before conducting this interview**

1. What is your role at this institution? What distance learning activity(s) are you involved in?
2. What tools or techniques are you using to support distance learning? Are you exploring any new technologies?
3. What are the technical challenges the distance learning or e-learning activity(s) have faced? How have you addressed these?
4. Do you feel that the equipment that you have is adequate for the distance learning activity that exists? What equipment do you have? What equipment would be needed if you were to scale up?
5. Do you provide training to others on IT and other distance learning technology? What type of training? Who do you train?
6. What communication technology does your site use (e.g., telephone, fax, DVC, videoconferencing?) Problems/issues?
7. Do you have internet service? What kind? What is the quality? Is it adequate for your needs? Bandwidth?
8. What internet service provider (ISP) do you use? Are you satisfied with the services? How reliable is the connection? Cost?
9. Do you have computers with CD or DVD capabilities? Yes No
10. Do your computers have USB ports? Yes No
11. Did you need to design the computer programme or was it an existing programme?
12. What off the shelf software do you use? What needed to be developed for current distance learning?
13. How often do you have power outages? How long to recover?
14. Do you have back-up power (i.e. generator, solar panels)? Yes No
15. Do you have an Uninterruptable Power Supply (UPS) on each of your internet infrastructure (i.e., computers, network equipment—satellite)? Yes No
16. Other comments?
I-TECH Tanzania Distance Learning Assessment
Preceptor Questionnaire

**Use the Introductory Script before conducting this interview**

1. What is your role in the distance learning or e-learning activity(s)?

**Overview of preceptor’s role and structure of the course/activity(s)**

2. How long have you been a preceptor for the distance learning or e-learning activity(s)?
3. How many students do you oversee at one time? How many distance learning students have you been the preceptor for?
4. How do you interact with the participants? How often and when does this interaction take place?
5. How do you interact with the facilitators/coordinators of the distance learning program? How often and when does this interaction take place?
6. What is the best part of being a preceptor for the distance learning or e-learning activities?
7. What is most challenging of teaching/facilitating distance learning or e-learning activities?
8. Do you also act as a preceptor to students who are taking a face-to-face course as opposed to a distance learning course? If yes, have you noticed any difference in the preparedness between the two groups of students?

**Training/orientation of preceptors**

9. How were you trained or oriented to be a preceptor with this distance learning or e-learning activity(s)?
10. What resources are available to support you as a preceptor of the course? Are you paid?
11. Are you familiar with the learning materials that the students receive and use in the course? What is your opinion of the materials? Do they relate to the work the students do in the clinical setting? Please explain.
12. Do you receive guidance from the distance learning programme coordinators regarding what the student should be learning or competencies to be mastered? Please explain.

**Evaluation of participants**

13. How are participants evaluated? What is your role in their evaluation?
14. How do you interact with the distance learning course coordinator regarding the placement of students, addressing challenges that come up during the clinical rotation, etc. Are you satisfied with the interaction? Please explain.
15. Do you feel participants are adequately prepared upon completion of the course? Why or why not?
16. Has there been participant drop out in the distance learning or e-learning activity?
   □ Yes □ No
   a) Why do you think that is?
17. How are recent graduates of distance learning or e-learning activity(s) putting to use their new skills, knowledge and degrees/certificates?

**Wrap-up**

18. How can the distance learning programme coordinators motivate and encourage other preceptors to work with students?
19. Is there a need to expand or scale-up current distance learning or e-learning activity(s)?
   □ Yes □ No
   b) If yes, how? (i.e. in terms of content, activity type and cadres)
20. Any other comments?
I-TECH Tanzania Distance Learning Assessment
Daily Summary Form

**Instructions:** Complete this form at the end of the day with your team members. Complete this form after all interviews are complete and all interview notes have been refined. This should be a summary of all the interviews you conducted today. This overall summary will help us identify themes for the debrief and final report.

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Please list the programmes visited and people interviewed today

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1. What are the two or three most important things that you learned today?

2. What were the key achievements/successes of the distance learning activities, programmes or courses? (Please specify which activities, programmes and courses you are referring to.)

3. What were the key challenges of the distance learning activities programmes or courses (please specify which activities, programmes and courses you are referring to) and how are sites overcoming these challenges?

4. What are the key technological considerations and challenges? How are sites overcoming these challenges?

5. What are key training areas, cadres to be trained and demand for distance learning or e-learning programs that came out in the interviews?
I-TECH Tanzania Distance Learning Assessment
Interview Guide for Health Decision Makers

Objectives
1. To gain their insight as to training needs of HCWs in Tanzania.
2. To determine if distance learning is one viable option to meet such needs.
3. To find out if their division of MoHSW has a training policy/strategic plan that may be amenable to including distance learning or e-learning options.

Questions:
1. What is the need for additional medical/health training in the regions? Which HCW cadre are most in need of training in Tanzania? What type of training is most needed (i.e., pre-service, upgrading, short course in-services, etc.)?
2. How is the government (MoHSW) planning to increase the number of health care workers to meet the demands of MMAM?
3. How does MoHSW view the use of distance learning as one of the options to meet the training needs of HCW?
4. In your particular program area, what could be the role of distance learning in meeting your training targets?
5. What national support is available for distance learning of HCWs in Tanzania? Do you feel that this support is sufficient to expand distance learning?
6. Has the Tanzania government used video conferencing and e-learning in other contexts? Was it successful or were there challenges? Please explain.
7. Are there any political considerations concerning the use of distance learning? Please explain.
8. What is the regulatory environment for distance learning in Tanzania? Are there constraints?
9. What are the challenges to MoHSW in implementing a distance learning programme?
10. What are the types of support that might be required for MoHSW and regions to effectively manage distance learning programmes?
I-TECH Tanzania Distance Learning Assessment  
Health Care Worker Survey

Thank you for participating in this survey. The objectives of the survey are:
- To get input on your training needs.
- To learn if you have had any experience with distance learning programs.
- To see if there is any interest in receiving training using distance learning.

**Distance learning** is defined as education that takes place between a teacher and a learner who are in different physical locations. It can be done through the use of print-based materials that are sent to the learner, via the internet or web, using a computer or memory stick, or even using a phone. Usually distance learning programs for HCWs include brief face-to-face classroom trainings (at the beginning and end and sometimes in between) and a practical component conducted at a health facility guided by a preceptor.

1. Please tell us about yourself:
   - Name: 
   - Job Title: 
   - Qualification or cadre: 
   - Facility where you work: 

2. What medical/health training needs do you have? (**tick and fill in all that apply**)
   - I need training to upgrade myself from my current cadre to _________________ (please indicate the cadre).
   - I need in-service training or short courses on the following topics (list three):
     1. 
     2. 
     3. 
   - I need to go to school to get a new qualification: _________________ (please indicate the qualification)
   - Other training needs: ___________________________________________

3. What have you heard about distance learning? Do you know anyone or have you ever participated in any type of distance learning? Please explain.

4. How do you envision that distance learning could meet your training needs?

5. How often do you use a computer in your work? **Please explain your answer.**
   - Never use a computer in my work
   - Use a computer once a month
   - Use a computer weekly
   - Use a computer daily

6. How do you use the computer? (**Tick all that apply to you below**)
   - To type documents, letters and reports using Microsoft Word
   - To develop PowerPoint presentations
   - To make Excel spreadsheets
   - To enter data into a database
   - To send and receive emails
   - To search the internet
   - Other: (**please explain**)

7. Of those applications you ticked above, which do you use the most?

8. What type of support or training do you think must be provided to a health care worker for him or her to effectively participate in distance learning?

9. If the MoHSW was to introduce distance learning to health care workers in your region, what category of health care workers should be targeted and why?

10. If the MoHSW was to introduce distance learning to health care workers in your region, would you apply to the program? Why or why not?
I-TECH Tanzania Distance Learning Assessment
Focus Group Discussion Guide: Training Partners

Target group: Partner organizations
Estimated time: 1–1.30 hrs

I: Introduction (about 10 mins)
Rapport building
1. Welcome
2. Focus group discussion coordinator provides background information on:
   • I-TECH Tanzania programme in general
   • The distance learning assessment
   • Definition of and examples of different types of distance learning (videoconferencing, computer-based training, use of internet for chat boards, email or workspaces, print-based courses with face-to-face, telemedicine/teleconsultations, use of phone, radio, Personal Data Assistant) and some ways it is currently being used to train HCWs
3. Focus group discussion coordinator mentions the objectives of the focus group discussion and with participants, agree on the format of the discussion;

Session objectives
4. To gain their insight as to training needs of HCWs in Tanzania
5. To determine if distance learning is one viable option to meet such needs
6. To determine their experience in supporting training through distance learning or e-learning
7. To find out if they have future training plans that include distance learning or e-learning options.

In-depth discussions (about 60–90 mins)
1. What HCW cadres are most in need of training in Tanzania/regions? What type of training is most needed?
2. How do you envision distance learning could meet this need?
   a. What are potential benefits?
   b. What are potential challenges?
      i. How could these challenges be addressed? What would need to be in place for distance learning to work?
3. What are your experiences in distance learning programmes in Tanzania? What were/are the factors for your success and or failures? What challenges were encountered?
4. What are your experiences in distance learning programmes outside of TZ? What were/are the factors for your success and or failures? What challenges were encountered?
5. Are there any policy considerations concerning distance learning? Please explain.
6. Do you see a possibility of collaboration of different partners in distance learning in Tanzania? How?
   a. What types of private companies might be needed to assist in setting up distance learning in Tanzania
   b. What other types of organizations might be available to assist?
7. Do you have current or planned distance learning programs? What are these?

11. How well do you think you would learn through distance learning or e-learning? Would there be many incentives for you for attending training through distance learning? Describe.
12. What do you see as some of the advantages/disadvantages of distance learning for training HCWs? What strategies could be used for overcoming the challenges?
13. How do you interact with your instructors—email, phone? Do you think you could get enough support through distance learning with your instructors? What might be some challenges?

15. What is your experience using the computer (and programmes)? What computer skills do you think you would need to participate in a distance learning program? Where do you access computers? Is there a place you could access computers from your hometown if you studied through distance learning there?

Closure (about 10 mins)
Facilitator: Thank you all, for participating in this group discussion. Before we close, I would like to invite additional questions and/or information that might enrich our discussions?

Facilitator: Summarize the discussion, clarify and confirm the information, thanks the participants and indicate the next steps.
I-TECH Tanzania Distance Learning Assessment
Observation Tool: Live Session

Target: Live synchronous session (i.e. internet-based or videoconferencing)
Observer name: Date:

<table>
<thead>
<tr>
<th>Place:</th>
<th>Institution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length:</td>
<td>No. of participants:</td>
</tr>
<tr>
<td>Name of course:</td>
<td>Topic of session:</td>
</tr>
<tr>
<td>Brief description of DL or eLearning activity(s):</td>
<td></td>
</tr>
</tbody>
</table>

1. Describe the structure of the session. (e.g. lecture with slides, discussions, etc.)
2. What type(s) of media/technology was used? (i.e. teleconferencing, web-conferencing, internet chat)
3. What software programme was used? (i.e. Adobe Connect Pro Live, Skype)
4. Describe the materials used for the session and get copies if possible (i.e. Slides, handouts, video, etc)
   a) How were they used in the session?
   b) Were they visually pleasing?
5. Describe the room used for the sessions. Did it seem adequate?
6. Regarding the room, please note the following:
   - Sufficient lighting
   - Air conditioning
   - Adequate furniture
   - Electrical receptacles available
   - Wired for Internet
   - Wired for telephone
   Was it noisy?
   Did there appear to be good security for the equipment and room?
7. Did technological problems occur? [ ] Yes [ ] No
   a) If yes, describe the technical problems.
   b) How were they dealt with?
   c) Were they resolved?
8. Were participants able to hear and understand the presenter easily? If no, describe the problem?
9. How did participants interact with the facilitator?
10. How did the participants interact with other participants?
11. Did participants ask questions? [ ] Yes [ ] No
    a) If yes, were they answered?
12. What type of learning methods were used (lecture, cases, discussion, demonstrations, videos, role plays, simulations)?
    a) Were there learning methods that seemed to work better than others via the technology?
13. Did participants appear engaged?
14. What was the best part of the DL session?
15. What was the most challenging part of the DL session?
16. Did the session seem well organized? If no, what were the problems?
17. Based on your observation, how could the session be improved?
Appendix B
Summary of Programmes
Introduction

This appendix presents a summary of all distance learning programmes reviewed and/or visited for this assessment. It contains six sections:

- Section B.1 is a summary of the distance learning programmes that are part of the national Centre for Distance Education (CDE), Zonal Health Resource Centres (ZHRCs), Clinical Assistant Training Centres (CATCs), Clinical Officer Training Centres (COTCs), and Zanzibar Ministry of Health and Social Welfare (MoHSW).
- Section B.2 summarises all other reviewed distance learning programmes in Tanzania.
- Section B.3 contains reports from two conferences related to distance learning that were attended by assessment team members.
- Section B.4 includes data from in-person interviews conducted with representatives of information technology (IT)/distance learning organisations in Tanzania to gain contextual knowledge.
- Section B.5 is a summary of distance learning programmes in countries with a context similar to that of Tanzania.
- Section B.6 is a summary of distance learning programmes throughout the I-TECH network.

All of the information contained in these sections was gathered through interviews, site visits, and background research. It should be noted that data from interviews with students, tutors, and others are subjective, as are the data collected during the site visits. Although an attempt was made to present parallel information for all programmes, there are some variations due to difference in the information that was available. Every effort was made to check facts and to distinguish opinions from facts. Given the large amount of data collected and the number of data collectors, however, the information provided may contain some errors. In addition, many of the statements in these summaries are from interviews or websites, and as such are the opinions of the interviewees or of those who created the websites, not necessarily of the writers of this report. Finally, to protect the confidentiality of the sources of the information, statements and opinions may not be attributed to a specific person. It is hoped that readers of these summaries will point out any factual errors by using the contact information provided at the beginning of this report.
B.1 Visits to the Centre for Distance Education (CDE), Clinical Assistant Training Centres (CATCs), Clinical Officer Training Centres (COTCs), Zonal Health Resource Centres (ZHRCs), and Zanzibar Ministry of Health and Social Welfare (MoHSW)

This section summarises site visits to the CDE, CATCs, COTCs, ZHRCs, and Zanzibar MoHSW. The following specific sites were visited:

- CDE, Morogoro (page 162)
- CDE, Morogoro: Collaboration with Cardiff University, UK, on a Sexually Transmitted Infection (STI) Module for Clinical Officer (CO) to Assistant Medical Officer (AMO) Upgrade Programme (page 166)
- CDE, Morogoro: Maternal and Child Health Aide (MCHA) to Enrolled Nurse (EN) Upgrade Programme (page 168)
- Maswa CATC: Clinical Assistant (CA) to CO Upgrade Programme (page 170)
- Kilosa COTC: CA to CO Upgrade Programme (page 176)
- Kigoma CATC: CA to CO Upgrade Programme (page 178)
- Eastern ZHRC, Morogoro (page 179)
- Lake ZHRC, Mwanza (page 180)
- Northern ZHRC/Centre for Educational Development in Health Arusha (CEDHA): Diploma in District Health Management for Health Managers and Health Workers in the Districts (page 182)
- Northern ZHRC/CEDHA: E-Collaboration Project using Global Campus 21 in collaboration with Internationale Weiterbildung und Entwicklung (InWEnt), MoHSW, and ZHRCs (page 186)
- Western ZHRC, Kigoma (page 190)
- Zanzibar MoHSW Continuing Education Unit (CEU) (page 191)
CDE, MOROGORO

Date of Site Visit: June 23, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one IT specialist
- Site observation

Website: None

Description of Programme Activities

The CDE’s role is to serve as the MoHSW’s national centre for the development, coordination, and implementation of distance learning programmes for health care workers (HCWs) in Tanzania. The CDE was established more than a decade ago in the Eastern Zone in Morogoro with the conceptualisation of two programmes: one to upgrade CAs (formerly known as rural medical aides or RMAs) to COs, and the other to upgrade MCHAs to ENs (formerly public health nurse [PHN] B’s). The CDE also collaborates with Aga Khan University (AKU) on a third programme to upgrade ENs to registered nurses (RNs). CDE programmes are conducted through various Health Training Institutes (HTIs) throughout the country.

The CDE is housed within the Eastern ZHRC. The public health nursing school that is affiliated with the Eastern ZHRC is used as a study centre for the MCHA to EN and EN to RN upgrade programmes. The objectives of the CDE and its programmes are to update HCWs’ knowledge, skills, and attitudes to improve their performance and ultimately the quality of care; upgrade them to attain recognisable professional qualifications; and give them more opportunities for training and career development.

The MoHSW is asking the CDE to scale up its upgrade programmes to cover the entire nation as part of Mpango wa Maendeleo wa Afya ya Msingi (MMAM) (MoHSW, 2007a). The CDE works with the ZHRCs on implementing some distance learning programmes, and the ZHRCs’ role in distance learning is expected to increase in the coming years.

Target Population

The CDE conducts upgrade programmes only for HCWs at this time. Since its inception, national training through distance learning has involved upgrading of 890 participants: 702 CAs to COs, 84 MCHAs to ENs, and 104 ENs to RNs. This number is expected to rise steadily in the near future as a result of MMAM requirements.

Successes and Advantages

- Establishment of several study centres to support distance learning students (COTCs in Musoma, Machame, Mvumi, Mafinga, Kilosa, Lindi, Masasi, and Mtwara; CATCs in Kigoma and Maswa; Nurse Training Centres [NTCs] in Morogoro and Bagamoyo), with planned expansion to others (e.g., Ifakara Assistance Medical Officer Training Centre [AMOTC]).
• Training of 59 distance learning tutors (11 abroad and 48 locally). The training encompassed teaching methodology; writing skills; distance learning skills, including student assessment and clinical supervision; and basic computer skills.

• Collaboration with partners (AKU, Ministry of Health/African Medical and Research Foundation (MOH/AMREF) Uganda, and Cardiff University in the UK) to develop materials and implement programmes.

• Development of printed distance learning modules by a working group of local tutors.

• Graduation of 97 CAs to become COs (32 from Maswa, 36 from Kilosa, 17 from Masasi/Mtwara, 3 from Machame, 1 from Mafinga, 2 from Kigoma, 5 from Musoma, 1 from Lindi).

• Work begun by the CDE on sharing with other countries experiences and lessons learned in managing national distance learning programmes for HCWs. Recently, the CDE hosted a Ugandan team with which it shared information about its upgrade programmes. The head of the CDE also visited the Ugandan national programme when the CDE was first launched. Exchanges have occurred with the UK and Germany as well.

• Awareness raised about the importance of distance learning for HCWs in Tanzania.

• Low dropout rate. Since 2000, there have been just 17 dropouts among 890 students.

• No tuition fees for students as the MoHSW covers those fees, although students pay some costs, such as postage and expenses during clinical rotations.

**Challenges and Disadvantages**

• Bureaucratic impediments inhibit effective and efficient planning, coordination, and implementation of national distance learning programmes:
  – A severe shortage of distance learning staff at the CDE. Currently there are only two employees.
  – Inadequate funding from the MoHSW to support programmes with respect to office operations, learner support, capacity building, training of distance learning experts, development and distribution of modules, and grading and monitoring of student work.
  – Courses primarily print-based—no CD-ROMs or media used.
  – Limited space for programme management.
    - Limited space for expansion and development
    - Few and congested office rooms, no classrooms for meetings and face-to-face sessions, no rooms for tutors, no hostel and catering services for students attending face-to-face sessions, no library, no Health Learning Materials unit for materials development, and no conference hall for digital videoconferencing
  – Inadequate number of distance learning tutors and preceptors to support learners in face-to-face sessions, clinical placements, and practicum assessments.
  – Computer illiteracy among distance learning students.
  – Inadequate publicising of distance learning programmes to various stakeholders, including employers.
  – With the advent of MMAM, the challenge of identifying strategies to increase enrolment and output and introduce more distance learning courses in response to high demand.

• Decentralisation of tasks to the zones is inhibited by funding constraints. Plans for the national distance learning programme include decentralisation, with the ZHRCs and HTIs expected to take a major role in implementation activities, such as recruitment,
student assessment, clinical supervision, and student monitoring. In reality, however, this is not happening.

- Support to the ZHRCs and HTIs for the implementation of distance learning is inadequate, making programmes less effective in providing learner support.
- It is difficult for only two staff members to distribute, receive, and grade 900 students’ assignments and to process applications (which increase each year).
- The limited number of CDE staff hampers coordination with preceptors for the practica, with tutors for training and curriculum development, and with the ZHRCs and HTIs for exams and on-site sessions.
- Communication between the CDE and the ZHRCs and HTIs and between the CDE and students appears to be insufficient.
- The HTIs do not receive documentation on students’ progress on assignments and exams or clear information about their performance in their practica.
- Programmes lack guidelines and competencies for programme administrators, tutors, and preceptors regarding their roles and responsibilities.
- Programmes lack adequate support for students. Some students reported feeling isolated and not having contact information for other distance learning students in their regions.
  - Students are not prepared for learning through the distance learning modality.
  - Students receive inadequate feedback on their performance.
  - Students are inadequately supported in English-language skills.
  - Learning materials are in short supply or lacking.
- IT support is inadequate for computer labs at HTIs.
- Information and marketing materials about the programme are not available for potential students and employers.
- Students lack basic computer skills and access to computers and the internet.
- Programme personnel, including tutors, preceptors, and curriculum developers, receive insufficient training.
- Financial assistance is inadequate to motivate tutors, clinical tutors, and preceptors to support students.
- Curricula are outdated. Training materials/modules on ‘Distance Education Approach’ were last updated in 2002 and 2004.
- Monitoring and evaluation plans are not in place.
- Anecdotal evidence on the performance of traditional vs. distance learning students is currently mixed.

Platforms/Media/Materials Used

All programmes incorporate a blended learning approach. Programmes are predominantly print-based for the self-study portion, and also include a practicum component overseen by a preceptor and face-to-face classroom-based sessions that vary in regularity across programmes. Communication between students and tutors occurs by phone, face-to-face, and occasionally by e-mail. There is limited technology; no materials are placed on CD-ROM or in any other electronic format for students and tutors. Training/learning materials include flip charts, overheads, handouts, and textbooks.

A needs assessment is conducted to determine what materials need to be revised or developed. A writer’s workshop is held to identify deficiencies in the materials. The CDE recruits experienced tutors from the COTCs and nursing schools to participate in these
workshops. After being trained in writing skills, participants review and revise the training materials, which are then pilot tested and finalised.

**Evaluation**

To assess student performance, the CDE uses mainly assessments built into the modules, exercises, case studies, and tutor-marked assignments. The CDE provides end-of-module examinations, which are supervised by the ZHRCs and HTIs. Students are also evaluated through practicum and clinical rotation assessment reports, practicum procedure books, face-to-face tutorial reports, mock examinations, and national qualifying examinations that are supervised by the ZHRCs and HTIs. As noted earlier, 97 CAs have graduated thus far to become COs; they were awarded a diploma in clinical medicine after having passed the final national qualifying examinations set by the MoHSW. Students who pass receive a letter of commendation, and those who do not pass are able to re-take the exam.

**Site Inspection Comments**

The CDE shares resources with the Eastern ZHRC in Morogoro (see the summary of the Eastern ZHRC below for details). The bandwidth available to the CDE is through the very small aperture terminal (VSAT) system, which is shared. As a result, the bandwidth available for videoconferencing may be insufficient unless some computers are turned off. The CDE uses telephones but does not have a fax machine.

**How Programmes Are Addressing HCW Shortages**

CDE programmes are addressing the HCW shortages by:

- Increasing the number of skilled COs and ENs who work in primary health care facilities.
- Contributing to the Primary Health Services Development Programme (PHSDP)/MMAM through in-service upgrading that leaves slots in residential programmes available for pre-service training.
- Teaching an appropriate skill mix for the provision of quality health care.
- Enabling HCWs to learn/upgrade their skills while working so they are available for the majority of the time to deliver quality health services to the community.

CDE programmes do not provide any pre-service training at this time.

**Future Planning/Vision**

The CDE aims to offer a leading national distance learning programme capable of providing quality training for HCWs. As noted earlier, there are plans to introduce a CO to AMO distance learning upgrade programme in collaboration with the Tanzania Training Centre for International Health Ifakara AMOTC. An STI module developed in collaboration with the University of Cardiff, United Kingdom, is described below. Other planned distance learning programmes include upgrade programmes for laboratory assistant to laboratory technician, health assistant to health officer, and pharmacy assistant to pharmacy technician. The EN to RN upgrade programme is expected to expand to cover the entire country. Distance learning is now a priority in the Human Resources for Health (HRH) strategic plan and PHSDP/MMAM. It will become even more of a priority in the next fiscal year, receiving additional funding in the MoHSW budget. Funds allocated for distance learning have
increased from an annual average of TSH 50,000,000 to TSH 283,000,000 (USD 42,000 to USD 236,000) for July 2008 to June 2009. Should the additional funding materialise, the CDE would like to increase the resources used to support distance learning at the ZHRCs and the study centres; increase publicity for the program; increase staffing; train more distance learning tutors, preceptors, and mentors; and perhaps introduce more technologically advanced distance learning media, including Elluminate, a videoconferencing software package.

**CDE, MOROGORO: COLLABORATION WITH CARDIFF UNIVERSITY, UK, ON A SEXUALLY TRANSMITTED INFECTION (STI) MODULE FOR CLINICAL OFFICER (CO) TO ASSISTANT MEDICAL OFFICER (AMO) UPGRADE PROGRAMME**

**Date of Site Visit:** Not applicable

**Data Source for Summary:**
- Written questionnaire from one programme manager

**Website:** None

**Description of Programme Activities**

The CDE partnered with the Medical School at Cardiff University in the UK to design and develop a distance learning module on syndromic approaches to counselling patients with STIs and HIV and AIDS. This project is funded by a United Nations Educational, Scientific and Cultural Organisation (UNESCO) committee based in Wales, UK. This module is intended as the first of a number of modules that will be launched in 2008 as a programme to upgrade COs to AMOs in Tanzania; modules in internal medicine, surgery, paediatrics, obstetrics and gynaecology, and community medicine will be developed next. Each of these modules contains several units.

The programme consists of a detailed self-study guide that is currently print-based but will be converted to CD-ROM in the near future. The self-study portion includes supplementary readings. A tutor will provide support to students throughout the self-study portion. The programme also includes a face-to-face session and assessment workshop to be held at the beginning and end of the module. The purpose of the face-to-face sessions is for tutors to ensure students’ understanding of the materials, assist in the transfer and retention of learning, and provide feedback on student performance. They are meant to act as a bridge to clinical placement of the COs. Materials have been developed for the face-to-face sessions to guide the tutor. The programme will be marketed through the networks of the CDE.

**Target Population**

The course is designed for students enrolled in the CDE’s new CO to AMO distance learning upgrade programme. A pilot of this module is currently being conducted at the CDE in Morogoro with 50 COs. The pilot site for face-to-face sessions and clinical placements will be at Ifakara AMOTC/St Francis Hospital, Ifakara. The course may also be used for current AMOs in residential programmes for continuing professional development credit. Twelve tutors were identified and received training at a 3-day workshop held in March 2008. They are experienced tutors, but distance learning is a new teaching modality for most of them.
Successes and Advantages

- Increased opportunities are provided for COs.
- Distance learning can reach those in the remotest parts of Tanzania and support them in independent learning.
- Print-based distance learning was chosen as the modality for the programme to reach COs who lack access to technologies and other learning and teaching formats.

Challenges and Disadvantages

- Establishing the levels of knowledge and competence among the target audience (COs) has been challenging, rendering it difficult to prioritise learning needs and approaches in the curriculum.
- During a visit to Tanzania in 2007, Cardiff University attempted to address this challenge by obtaining information from the MoHSW and Ifakara Health Institute (where face-to-face training was under way) and sent out a needs questionnaire to COs and trainee AMOs. A second visit 12 months later helped in refining the study guide, devising clinical histories for assessment purposes, and defining the tutor role. Caveats were inserted in the flow charts to account for epidemiological factors. Between visits, e-mail and occasional telephone calls were used to communicate.
- As with all distance learning programmes in Tanzania, access to computers is a challenge. Computer access would enable adaptation and greater flexibility of the learning materials through use of CD-ROMs. Internet connectivity would make possible a richer, more up-to-date learning experience and learning modalities that would enhance participants’ autonomy in continuing professional development and evidence-based approaches. Also as with other distance learning programmes, contact with tutors and travel to a face-to-face workshop may be difficult for some participants. Cardiff University has not explored the possibilities, but one physician involved in the design and development of the programme suggested that laptops, hand-held devices, and mobile phones have the potential to address these challenges.
- Funding may be a challenge. Further resources are needed to complete the remaining modules and package the programme. This role falls to the CDE/MoHSW. UNESCO Wales is unable to fund further module development. An application has been submitted to the Gates Foundation to fund a supplementary module, but the programme manager noted that the foundation’s terms of reference do not appear to cover this kind of development. The cost to develop the STI module has been around £25,000 (which converts to about TSH 43,500,000 or USD 36,000).
- Logistical challenges include communication, transport for students, dissemination of the module, and access to the ZHRCs.
- The face-to-face component of the course was included because of the challenge of tutor communication with students during the independent study portion and students’ need for greater guidance in their learning. The programme manager said that since distance learning is new as a modality in Tanzania, more tutors need training in how to use it.

Platforms/Media/Materials Used

Materials such as the self-study guide are print-based, but as noted, there are plans to convert them to CD-ROM. Activities built into the study guide include tasks, readings, and
reflective activities. Dialog with tutors and interactive activities in the face-to-face sessions are also utilised.

**Evaluation**

Students are evaluated with multiple-choice questions, observational assessment (using simulated patients), and self- and peer assessment. The pilot of the programme is currently being conducted. In the interim, there has been some evaluation of the self-study guides with a group of prospective tutors. They made specific recommendations and gave positive feedback about the content and approach of the study guide. A final evaluation report on the project will be prepared when the pilot is completed. The next meeting to finalise the STI module is planned for March 2009 and will involve the Eastern, Northern, and Lake Zones.

**Future Planning/Vision**

The modules can be applied/adapted for AMOs in need of continuing professional development, and possibly for nurses and other applied HCWs.

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**CDE, MOROGORO: MATERNAL AND CHILD HEALTH AIDE (MCHA) TO ENROLLED NURSE (EN) UPGRADE PROGRAMME**

**Date of Site Visit:** June 23, 2008

**Data Sources for Summary:**

- Written questionnaires completed by ten students
- Interview with one student
- Interview with one programme manager
- Interviews with three tutors
- Site observation (a face-to-face class where the topic of the day was the physiology of the female pelvis)

**Website:** None

**Description of Programme Activities**

This programme upgrades MCHAs to ENs. MCHA is the entry-level position for many HCWs, so upgrading to EN provides a first step for many midwives to become nurses. One MoHSW official pointed out that maternal mortality is a major challenge in Tanzania and is viewed by some within the ministry as an even greater problem than the HIV and AIDS pandemic, making this programme especially important.

This 2-year programme was launched in January 2007 following approval by the Tanzania Nurses and Midwives Council (TNMC). The first class had not yet graduated at the time of these interviews. The programme is conducted from the CDE with the support of two study centres in Tanzania—Morogoro PHN School and Bagamoyo NTC. Nationwide there are 84 individuals enrolled; by the end of 2008, the programme hopes to enrol up to 500 MCHAs.

The curriculum includes training in a broad range of MCH services, including antenatal and postnatal care; assistance during delivery; care for infants and newborns; growth monitoring for children under age 5; family planning services; and HIV and AIDS services,
including prevention of mother to child transmission (PMTCT). All of these topics are packaged into seven comprehensive modules. The course is designed to fill the needs of the dispensaries and health centres located at the ward and village levels of the Tanzanian health system, where personnel shortages are most severe. The course organisation consists of three clinical rotations of 6 weeks each. The first and second rotations take place at students’ workplace or a nearby hospital during the first year, and the third rotation takes place at an HTI that is an NTC. Face-to-face tutorials are provided twice a week for 6 weeks at Morogoro PHN School, and practical demonstrations are given at Morogoro Regional Hospital.

**Target Population**

The target population is MCHAs, a cadre that is being phased out by the MoHSW. The current 84 students hail from Morogoro, Dar es Salaam, Coast, Tanga, Iringa, Kilimanjaro, Kagera, Dodoma, Arusha, and Mbeya. The MoHSW recently approved acceptance into the programme of medical attendants and nursing assistants who have graduated from Form IV.

**Platforms/Media/Materials Used**

The programme uses blended learning that includes face-to-face classroom sessions involving discussion, role plays, demonstrations, and tests, a print-based self-study component, and a clinic-based practical component. Generally, all students voiced satisfaction with the training materials and their related costs. To find references, students go to the ZHRC resource centre, where there is a small room with some reading materials. The programme manager and tutors interviewed said that the resource centre’s facilities are inadequate for students and tutors. Improved resource centre materials in terms of quantity and quality are needed for both students and tutors.

Students interact with the tutor face-to-face and other times via e-mail or telephone and post. Most students noted that they collaborate with each other over the phone. One student said students form discussion groups after work at each others’ houses. However, one student stated, ‘I don’t interact.’

**Successes and Advantages**

- Most of the student respondents answered that distance learning allows them to spend more time with their families and to balance other aspects of their lives.
- One student felt that distance learning improves nursing procedures and helps to further HCWs’ education.
- Another student said that distance learning was a relatively inexpensive way to learn.
- Students noted that their relationship with staff at the CDE is good.
- Students said that the tutors are good and that they are generally satisfied with the programme.

**Challenges and Disadvantages**

- As instruction is given in English, students who are not fluent in English struggle. During the site visit, it was noted that many students felt uncomfortable speaking in English. Some students voiced dissatisfaction with materials that were written in English.
- Students struggle with time management. One said that there is insufficient time to learn because of other interests. Students feel they need more time to study.
One student cited a lack of interaction with tutors, but it was unclear whether this was a systemic problem or one particular to this student. Some students noted that while they feel they are supported by tutors, the tutors ‘have little time’. Students said they would like to have more tutor involvement.

None of the students had any experience with using computers.

**Evaluation**

Students are evaluated through assignments, and they take the same national qualifying exam as those in resident EN programmes. Students noted that they give feedback to tutors when it is requested. Several of the students said that after they complete the programme, they expect to become better HCWs. One student described distance learning as a stepping stone to further growth.

**How Programmes Are Addressing HCW Shortages**

By providing a pathway to graduate from a lower-level to a higher-level HCW classification, the programme increases students’ skills and morale, as well as the number of ENs working in primary health care facilities. It thereby contributes to an appropriate skill mix for providing quality health care.

**Future Planning/Vision**

The CDE sees the expansion of this programme to cover all zones as a major goal.

**MASWA CATC: CLINICAL ASSISTANT (CA) TO CO UPGRADE PROGRAMME**

**Date of Site Visit:** June 26, 2008

**Data Sources for Summary:**

- Interview with one programme manager
- Interviews with two tutors
- Interviews with four students
- Site observation

**Website:** None

**Description of Programme Activities**

Today, the CA to CO upgrade programme is the largest programme coordinated out of the CDE in Morogoro. The programme was initiated in 1998 and launched as a pilot in 2000. Actual implementation of the course was gradual; there were several delays and a number of dropouts. After a few years, the programme had become functional, and in 2004 the first final exam was given. The CATCs in Maswa and Kigoma and the COTC in Kilosa currently act as study centres for the programme and serve a coordinating role for students in corresponding regions and zones (the Kilosa and Kigoma programmes are discussed in the following two sections). The programme consists of face-to-face sessions, a practicum component, and a print-based self-study component.
Structure

The programme’s structure is heavily centralised at the CDE in Morogoro. All interested students apply directly to the CDE, regardless of whether they live in that region. Once accepted, they receive modules and associated assignments from Morogoro. When they complete an assignment, they send it back to Morogoro (via post) to be graded. The local CATC in Maswa arranges and oversees the exams, but has little direct communication with students until they come to the institution for on-site training.

The duration of the course is set according to each individual’s own pace, but most students are expected to complete the course in a maximum of 3 1/2 years. Each institution appears to be instituting the programme slightly differently. At Maswa, the first 2 years involve no face-to-face interaction with tutors, while the final year includes didactic, classroom-based sessions. Throughout the first 3 years, students participate in a practicum. During the first 2 years, the student’s local ZHRC assigns the practicum, but the ZHRC does not act in a coordinating or monitoring role once the practicum has been assigned.

During the first 2 years, students receive support mainly from a preceptor, who records feedback for them on a document provided by the CDE, indicating areas in which the student needs to gain skills. The course consists of 14 modules and three practicum rotations. The first two rotations last 6 weeks each and are typically conducted at the student’s workplace or a nearby district hospital. This facility-based practicum portion is overseen by a preceptor. The third rotation lasts for 8 weeks and is held at the CATC or COTC study centre with which the student is affiliated. Students choose when and for how long they want to attend the CATC or COTC for face-to-face sessions. Based on experience with previous distance learning students, Maswa CATC recommends that students attend in person at the CATC for the last 6 months of the programme. For the on-site portion, students and tutors at the CATC determine what their course of study should be, depending on the student’s areas of weakness. Students can then tailor their last 6 months of study to meet these needs so they can pass the final exam.

At Maswa CATC, there is currently a traditional, classroom-based residential CA to CO programme that lasts 2 years. When distance learning CA to CO students attend the CATC, they study alongside these traditional students. Currently, there are 54 resident and 7 distance learning students enrolled at the CATC. To date, 32 students have graduated from the distance learning programme.

Cost

The only fees students must pay are for travel, sending materials to Morogoro by post, photocopying, and room and board (usually at a guesthouse) during the in-residence portion of the programme (the last 6 months). Most students are working in the public sector, and the government covers their tuition. Tuition for students from the private or faith-based organisation (FBO) sector is usually paid in whole or in part by their organisation.

Tutors

Communication with tutors at the other training centres conducting this same distance learning programme is quite limited. Staff noted that tutors, as a group, have met only twice since the programme’s inception in 2000. Because of the small number of tutors, students have little interaction with them. Most students correspond primarily with the CDE programme coordinator in Morogoro rather than with tutors. At Maswa CATC, there is only one tutor specifically dedicated to distance learning students.
Target Population

The Maswa CATC was recently converted from a COTC to a CATC. The distance learning programme, however, is designed to upgrade CAs to COs. Interviewees reported that students must be highly self-motivated to participate in the programme as they have minimal in-person contact with tutors and minimal supervision. Computer skills and access to a computer are not essential because most materials and all assignments are print-based.

Successes and Advantages

- Some students find it difficult to get into traditional, in-residence programmes, so the distance learning programme provides them an opportunity that they otherwise might not have. The reason for this is that traditional programmes have less space available for students.
- Students are passing government exams and becoming COs.
- Students believe that the modules they are using are of good quality and noted that the assignments they are given are helpful in their learning.
- The distance learning programme allows students the option to continue working, live with their families, and have access to an affordable education. For example, one student who works at a private hospital said that it is possible for him to enrol in this course because it is free, and he does not need to quit his job to further his education.
- There are few schools that supply courses to upgrade HCWs, so this programme fills a gap.
- The programme’s flexibility is appreciated by the students, as they can progress at their own pace.

Challenges and Disadvantages

- Maswa CATC and Lake ZHRC would like to take a larger role in coordinating the programme at the local level to improve coordination and student learning.
- Course materials are developed in Morogoro, but not always in a timely manner, and new modules have not been created for several months. As a result, students often experience delays in receiving their materials. Some students said they had already been waiting 9 months for new modules.
- Students lack orientation about distance learning. Students reported doubts that they could learn without tutors and lectures, so they were not as serious as they should be in their self-study readings.
- The course provides no computer training for distance learning students.
- Among the first cohort of students that took the exams, only 3 of 15 passed. The students who failed had to continue their studies for 6 more months; however, they were motivated by the success of the 3 who had passed, so they pursued their diploma and ultimately passed as well. This experience motivated the programme to institute the intensive 6-month period in which students attend classroom-based didactic courses.
- Students do not receive feedback on the work and assignments they send to Morogoro. One student interviewed said that despite sending his assignments to Morogoro to be graded, he had never once received a graded assignment or other feedback. Other students related similar experiences. When they called Morogoro to find out why, their questions were greeted with concern, but they were told that...
funding and resources were insufficient to allow for the return of materials and graded assignments.

- Insufficient financial support reaches the districts from CDE in Morogoro. In some cases, for example, tutors from the traditional (classroom-based) track are reluctant to support distance learning students as they are not paid extra to do so. More funding is needed to support additional distance learning tutors in the regions. Those who serve as preceptors to the students in their practicum rotations also require funding as their salaries from the MoHSW are already low, and they are being asked to take on the additional duties of a preceptor without extra pay.

- The centralised structure of the programme is problematic:
  - Not only is Morogoro CDE the only distributor for the course materials, but it is also the only centre that distributes, receives, and grades all student assignments and tests. As a result, the local COTCs reported not knowing the students’ skill levels and their strengths and weaknesses, and thus how best to assist them.
  - The CDE is also overwhelmed by the large number of student applications it receives since it is the only site that processes applications.
  - One solution suggested by programme staff was to decentralise this work, as well as other responsibilities, to the zonal, regional, and HTI levels. Funding to the CATC and ZHRCs would be necessary for this to be done.
  - Communication between the CDE and other sites and between the CDE and students is inadequate. One administrator interviewed said he is given no information about which students will be coming from where and no contact details. When students fail to show up, there is no way to know what happened to them. This lack of communication is not confined to the distance learning programme. In one devastating example, a student was accepted into the traditional programme, so she quit her job at an FBO to attend the in-residence programme for 2 years. She packed her bags and appeared at the CATC ready to move in and begin her studies. When she arrived at the CATC, she was told she was not on the list for the coming year. She was unable to attend, so her only option was the distance learning programme, which she elected to undertake, but she struggled to find a job and a place to live in a new town.

- There is no timetable for the course, only a list of the 14 modules and units within those modules, along with the maximum time a student may take to complete each. Given the already low level of student–tutor interaction, a timetable would at least provide students with more guidance on progressing through the course.

- Although students take a pre-test prior to participating in the programme, no one is assigned to help them determine the level at which their coursework should begin. When students have questions as they study on their own, there is no outlet to provide answers or assist them. Because of the poor communication among the CDE, the districts, and students, many students are not even aware that they have distance learning classmates in their area. For those able to make connections with other students, some have organised study groups. Providing this information to students would be an effective and simple way to improve local support to distance learners.
  One student who appeared for an interview was thrilled, but also frustrated, to find that he was in his third year and did not realise there were two fellow students in his area, who were also at the CATC for these interviews.

- During the practica, preceptors at the students’ sites send in a sheet to the tutors or principal at the CATC with very limited feedback. One of these sheets examined by the assessment team listed vague topics (e.g., pediatrics, gynaecology), and the feedback read simply ‘good’ under such categories as pediatrics. According to
programme staff, preceptors are given no guidelines to follow and no specific criteria students need to meet, so it is difficult for them to provide adequate and useful feedback. There are also no standards for what students should be able to do as part of their practicum experiences. Yet feedback is necessary to provide information on whether students are ready to sit for their exams and in what areas they need additional training. One possible solution to this problem would be to have a focal person who could be in contact with the preceptors at the hospitals.

- Many students enrol in this course because they know it is free; however, the costs of photocopying all the materials and sending in assignments/exams, as well as transportation expenses, can add up quickly. Since students do not receive the modules from Morogoro on time, they must photocopy hundreds of pages of print-based materials from the Maswa CATC library. One woman took a single module to be printed had to pay TSH 29,000 (USD 24). The book is currently waiting at the print shop while she saves enough money to pay for it.

Platforms/Media/Materials Used

The modules for the course are developed by the CDE. Students are often referred to other books and told to go to the hospital library to get them (although not all hospitals have a library). The materials for the first year include no case studies; their content appears to lack depth; and they also appear, according to interviews with students, insufficient for acquiring clinical skills without a tutor’s assistance. Nonetheless, students appeared to be satisfied with the materials, perhaps because this is all they have been exposed to.

Evaluation

Students are tested throughout the programme; as noted, their course exams are sent to and graded in Morogoro. They are also given a final, national qualifying examination. Preceptors evaluate practicum experience during the clinic rotations.

No formal programme evaluation has been conducted. According to the CDE, a ‘Distance Education Project Midterm’ review was done in 1999 and a final evaluation in 2001 by external consultants from Uganda and Kenya and an internal consultant from the MoHSW. Evidence from Maswa CATC thus far has shown that distance learning students do not do well on the exams until they come to the CATC for classroom sessions, whereupon they catch up on the theory and clinical skills they were supposed to be learning independently.

Site Inspection Comments

Maswa CATC has a small computer lab with four computers. VSAT internet access is available for all computers, but an IT tutor noted it often does not work or is slow. Traditional, resident CA to CO students take a computer course to learn internet and Microsoft Office skills, and during the site visit were taking a test on the computers. The room lacked air conditioning, and the computers appeared to be older-model PC desktops. One computer skills tutor was grading students’ tests, which he characterised as a standard MoHSW computer test. The test included questions such as ‘What does the acronym HTML stand for?’ There were no IT staff, although the IT tutors often helped problem solve any IT problems.
How Programmes Are Addressing HCW Shortages

There are many COs in Tanzania, but the number is still inadequate to meet the current demand for their skills. The distance learning programme was created to address this need, and is helping to increase the number of COs in the Lake Zone.

Future Planning/Vision

The programme’s future depends on the Maswa CATC’s receiving additional funding, as well as greater autonomy over the programme. Potential enhancements include the following:

- Add more face-to-face instruction to increase the interaction between students and tutors and enhance support for students.
- Provide financial assistance to students for boarding fees at the institution.
- Compare what the three training centres (2 CATCs and 1 COTC) participating in the programme are doing, and hold a conference to share what works well, identify problems, and suggest solutions. This could be done during the Principals meeting or the Annual Continuing Education meeting.
- Improve the marketing for the programme. Students are interested in learning about it, but little information is available.
- Provide incentives to tutors of traditional students so they will accept distance learning students into their classrooms.
- Increase the number of tutors working with distance learning students.

In addition to the above ideas, Maswa CATC made the following recommendations for improving the programme:

- Have the CDE send the materials/modules in a timely manner so that students can keep pace and graduate as planned.
- Have the CDE return test results to all students in a timely manner so they can know how they are doing and identify areas in which they require improvement. This information should also be shared with their local preceptors so practicum sessions can be tailored to address the learning needs identified.
- Decentralise the programme from the CDE, and give more responsibility (and necessary funding) to the local CATCs, COTCs and ZHRCs.
- Provide a course timetable to students and tutors with suggestions on the minimum time required to complete each module.
- Provide an orientation and training for preceptors, along with appropriate incentives to support students in their learning. Preceptors also need documents detailing competencies the students should gain in their practica so they can appropriately document students’ performance for the CATCs and COTCs.
- Model the programme after Open University of Tanzania programmes, which have regional centres with directors who supervise students in their regions.
- Determine and distinguish the roles of tutors, coordinators, preceptors, and supervisors.
KILOSA COTC: CA TO CO UPGRADE PROGRAMME

Date of Site Visit: June 24, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one tutor
- Interviews with three students
- Site observation

Website: None

Description of Programme Activities

Kilosa COTC coordinates with the CDE and the Eastern ZHRC, from which the students are recruited. It sees distance learning students only at the end of their second year of training, when they come for 8-week attachments. During this time, they rotate through medicine, obstetrics and gynaecology, surgery, paediatrics, and obstetrics clinical laboratory; attend classes; and meet face-to-face with tutors. They are assessed and evaluated during each rotation. Mock examinations are given to prepare students for final exams. See the previous section on the Maswa CA to CO upgrade programme for a general full programme description.

Target Population

This programme is designed to upgrade CAs to COs; graduating COs receive a diploma in clinical medicine.

Successes and Advantages

- So far, Kilosa COTC has upgraded 32 CAs to COs through distance learning and awarded a diploma in clinical medicine.

Challenges and Disadvantages

- The COTC is using pre-service funds for distance learning (in-service) to pay for staff, food, and other expenses.
- The COTC has only one computer with access to the internet. When a computer problem arises, the COTC, which is very isolated, must often wait a long time for a technician to fix it.
- Programme staff believe students need more time for clinical attachments.
- Other challenges include a lack of human resources, a lack of financial support for facilitators, irregular electricity, a lack of course materials, and students not reporting in time for clinical rotations.
Platforms/Media/Materials Used

Mainly print media are used, so computer skills and access to a computer are not essential. The curriculum covers such topics as surgery, communicable diseases, obstetrics/gynaecology, epidemiology, clinical laboratory, paediatrics, and statistics.

At Kilosa COTC, DVDs, CDs, telephone, and post are used to support student learning. During lectures, tutors use overhead transparencies, which are easy to use but expensive. The programme has only one LCD projector.

Evaluation

Students are tested throughout the programme. They also take a final test, the national qualifying examination, alongside students in the CO residence programme. A preceptor evaluates practicum experience during the clinic rotations.

Site Inspection Comments

The site has new physical infrastructure consisting of several buildings, furnished rooms, and plenty of room to grow. Buildings include a large administration building housing many furnished rooms for tutors and other administrative staff, a large library, and a conference hall and classrooms. The conference hall is favourable for distance learning as well as videoconferencing. If internet services were expanded, the conference room could be used for e-learning.

How Programmes Are Addressing HCW Shortages

By offering distance learning for HCWs, it is Kilosa COTC’s vision to provide training that will increase the supply of quality health care professionals.

Future Planning/Vision

Kilosa COTC desires more autonomy and authority in administering the distance learning upgrade programme. Those interviewed suggested that course notes, materials, and tests should be prepared and administered by the study centres themselves and that tutors should be trained in distance learning techniques. They also said they should receive direct support from the MoHSW for such expenses as tuition fees and room and board so they can coordinate the programme.

Kilosa COTC is currently considering what other cadres could be trained through distance learning (e.g., a programme for environmental technologists). While the COTC has an environmental lab, it is not well equipped. The theory for this programme could be delivered via distance learning, although the curriculum would have to be examined to determine how this could be done. Programmes to upgrade nurses assistants to ENs and laboratory assistants to laboratory technicians are also being considered.
KIGOMA CATC: CA TO CO UPGRADE PROGRAMME

Date of Site Visit: June 26, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one tutor
- Interview with one student
- Site observation

Website: None

Description of Programme Activities

As at Kilosa COTC, distance learning students attending Kigoma CATC come for 8-week attachments. During this time, they rotate through medicine, obstetrics and gynaecology, surgery, paediatrics, and obstetrics clinical laboratory; attend classes; and meet face-to-face with tutors. They are assessed and evaluated during each rotation. Mock examinations are given to prepare students for final exams. The CATC in Kigoma is housed with the Western ZHRC (see the section on the Western ZHRC below). See the section on the Maswa CA to CO upgrade programme for a general full programme description.

Target Population

The Kigoma CATC was recently converted from a COTC to a resident CATC. The distance learning programme, however, is designed to upgrade CAs to COs.

Successes and Advantages

- There has been one graduate so far. The current student will be the second graduate.

Challenges and Disadvantages

- Financial constraints and autonomous decision making are important issues for programme staff, who believe each zone should have its own budget for distance learning.
- Power outages occur frequently in the region. During electrical storms, telephones and computers must be disconnected even though the computers use uninterruptible power supplies.
- The recruitment for distance learning at this CATC is low—only two students have participated in the distance learning programme thus far.
- There is no IT specialist on site. Staff noted that they cannot easily get such specialists from IT learning institutions to provide needed services, but that when they do come, their service is satisfactory.
- The CATC is understaffed in its resident pre-service training programme, and lacks sufficient human resources to bear the additional workload of distance learning.
Platforms/Media/Materials Used

Only print media are used, so computer skills and access to a computer are not essential. The curriculum covers such topics as surgery, communicable diseases, obstetrics/gynaecology, paediatrics, clinical laboratory, epidemiology, and statistics.

Evaluation

Students are tested throughout the programme. They take the same final test as resident students, which is the national qualifying examination. A preceptor evaluates practicum experience in the wards. A programme manager noted that students are well trained by the time they finish the programme.

Site Inspection Comments

This CATC is not doing all it can to make use of the technology it possesses. Although it is collocated with the Western ZHRC, which recently received ten new desktop computers, the equipment was still in boxes when the assessment team visited the site. The site appears to be underdeveloped, as space and buildings are plentiful. The dormitories are rented out to students from other institutions, but they could be used to house distance learning students who come for their face-to-face and clinical training.

How Programmes Are Addressing HCW Shortages

With only one student, the programme is not helping to alleviate HCW shortages significantly.

Future Planning/Vision

To scale up distance learning activities, the CATC will need increased funding and staffing.

EASTERN ZHRC, MOROGORO

Date of Site Visit: June 23, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one practicum tutor
- Site observation

Website: None

Description of Programme Activities

The Morogoro site has three roles to play in the education of HCWs. It houses the CDE, which works at the national level and acts as overall coordinator for distance learning for the other seven ZHRCs and the HTIs that act as study centres. The second role of the Morogoro site is as coordinator of HCW training for the Eastern Zone. This includes coordinating and implementing training in various vertical programmes initiated by both the government and development partners. The third role of the Morogoro site is related to the training of nurses.
The Eastern ZHRC, located on the premises of the Morogoro Regional Hospital, is collocated with the Morogoro PHN School. As such, it provides a venue for face-to-face sessions, and it serves as a study centre and practicum site for the MCHA to EN distance learning upgrade programme. The ZHRC tutors also participate in CDE tutorial sessions, and some act as practicum tutors for distance learning students.

**Successes and Advantages**

- Its proximity to the CDE facilitates coordination and monitoring of distance learning students.
- A 50-hectare tract of land has been acquired for future expansion of the Eastern ZHRC and the CDE if enough financial support is provided for infrastructure development.

**Challenges and Disadvantages**

- Classroom space for face-to-face sessions is lacking.
- The ZHRC resource centre, which is used by distance learning students, lacks materials for both students and tutors.
- Funding and adequate human resources are lacking.
- Currently, the Eastern ZHRC and the CDE have inadequate space for infrastructure expansion and development.

**Site Inspection Comments**

Eastern ZHRC has 25 computers in a newly installed computer lab. The internet was implemented through VSAT at a reported speed of approximately 40 kilobits per second. However, all 25 computers appeared to be connected to the VSAT through a common switch, so the bandwidth is actually much less. If some of the computers could be disconnected from this switch, higher internet speeds could be realised, making it possible to support sophisticated webinars or even digital videoconferencing; the maximum bandwidth (or speed) provided by the VSAT could be as high as 25 x 40,000 = 1 megabit.

**LAKE ZHRC, MWANZA**

**Date of Site Visit:** June 25, 2008

**Data Sources for Summary:**

- Interview with two programme managers
- Site observation

**Website:** None

**Description of Programme Activities**

Lake ZHRC was visited primarily to gain insight into its role in coordinating with Maswa CATC on the CA to CO distance learning programme. Currently, no distance learning activities are coordinated out of Lake ZHRC, aside from its role in proctoring the exams of distance learning students in the Maswa CATC programme. The Touch Foundation is one of
the development partners operating in the Lake Zone, and while not funding the ZHRC directly, it has been funding improvements to Bugando Medical Centre and to HTIs in the zone, including the AMOTC housed with the Lake ZHRC.

Lake ZHRC serves four regions: Mwanza, Shinyanga, Mara, and Kagera. There are 22 HTIs in the zone, the majority of which are government facilities and some of which are faith-based. The ZHRC has ten staff (five academic and five support). The on-site AMO School has 90 students—45 in the first year and the same number in the second year. This is the school’s full capacity; if it had more students, it could not accommodate and supervise them at practicum sites. In addition to AMO activities, the ZHRC conducts courses such as the Tanzania Essential Health Interventions Project, currently being rolled out by the MoHSW’s National Expansion of the TEHIP Tools and Strategies Project. The tools covered in this course include PlanRep 2, Integrated Management Cascade, Strengthening Health Management, Community Based Rehabilitation of Health Facilities, and Integrated Management of Childhood Illness (IMCI).

A total of 268 distance learning students are enrolled in the CA to CO upgrade programme in the Lake Zone, which encompasses Shinyanga, Mwanza, Kagera, Mara, and their corresponding districts. These students are at different stages of their training. Maswa and Musoma COTCs are used as study and examination centres for these students. Mwanza ZHRC’s involvement in the programme is minimal, other than proctoring examinations for some distance learning students.

Successes and Advantages

- VSAT internet connectivity exists.
- There are 15 new computers ready to be installed.
- The ZHRC has a desire to take a larger role in distance learning programmes.

Challenges and Disadvantages

- The programme lacks a resource centre/library. Instead, trainees go to the Bugando Medical Centre library, where most of the reference materials are about internal medicine and are at the medical officer level. Moreover, use of the library is restricted as it is supposed to be for students of Bugando University.
- The new computers mentioned above are still in boxes. Each computer has an internet and electrical port. The ZHRC has been awaiting funding for 3 months to purchase computer desks and air conditioning for the room (no source has yet been identified).
- There is no IT support at the site.
- Staff need training in computer and internet skills.

Site Inspection Comments

From the offices the assessment team visited, it did not appear that all staff had computers, although this observation was not confirmed. The computer room was well equipped with internet and electrical ports for 15 computers, and a server was also set up. Security appeared to be good as there were bars on the windows of the computer lab. The internet connection is via VSAT, and the bandwidth is small (the exact speed was not known). Eventually the computer lab can be used by HCWs that come to attend short training courses.
Future Planning/Vision

- As noted, the ZHRC would like to take a larger role in coordinating distance learning activities in the zone.
- One staff member said the MoSHW had offered to train a staff member at Lake ZHRC in computer skills. He was to attend a week-long course on the subject and then return to teach other staff members. This offer was made several months ago, and he is unsure whether the training will still occur. This may be the MoHSW’s solution to building IT capacity at the ZHRCs.

NORTHERN ZHRC/CENTRE FOR EDUCATIONAL DEVELOPMENT IN HEALTH ARUSHA (CEDHA): DIPLOMA IN DISTRICT HEALTH MANAGEMENT FOR HEALTH MANAGERS AND HEALTH WORKERS IN THE DISTRICTS

Date of Site Visit: June 24, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one tutor
- Review of website

Website: None for programme (general website: http://www.cedha.ac.tz/index.html)

Description of Programme Activities

CEDHA is the HTI that is collocated with the Northern ZHRC. Its distance learning programme began in 2006 with funding from the Danish International Development Agency (DANIDA) through its Health Sector Programme Support project and the MoHSW. The programme was created in response to a needs assessment that found that district health managers lacked sufficient managerial skills. The result was a 3-year, modular diploma course focused on enhancing the supervisory skills of middle managers, such as Council Health Management Team (CHMT) managers, district health managers, and district health officers (DHOs). Its objective is to ‘improve health management skills and practices within the District Health System to bring about overall improvement in the quality of care’.

CEDHA is currently in the process of obtaining accreditation for the programme from the National Council for Technical Education (NACTE).

The programme takes place in four zones, with a total of 113 participants: 1) Northern Zone (32 participants); 2) Southern Highlands Zone, in Iringa (28); 3) Eastern Zone, in Morogoro (25); and 4) Southern Zone, in Mtwara (28). The overall programme and the content studied are the same across all four sites, and are coordinated and supervised at all sites by CEDHA.
Structure

The 3-year programme consists of nine modules (eight core modules and one foundation module). Students must begin with the foundation module, an introduction that covers skills in communication, writing, and computers, including basic statistics and word processing; it also teaches general study skills. The core modules are Health Sector Reform in the District Health System, Promoting Partnerships at the District Level, Management of Health Resources, Planning of District Health Services, Quality Management, Multi-Sectoral Disease Control (e.g., HIV and AIDS), Health Financial Services, and Health Care Technical Services.

Each module involves 2 weeks of residential, face-to-face instruction by tutors (at CEDHA), after which participants continue with field assignments at their work stations for 8 weeks at a time; these assignments are reviewed during the subsequent face-to-face session. In total, the course is equivalent to about 1,200 hours of study. Officially, the programme starts in the month of September, but some students are allowed to join at other times, depending on the circumstances.

Cost

Tuition is TSH 150,000 (USD 125) per module; for all nine modules, the total tuition cost is TSH 1,350,000 (USD 1,125). Additional expenses include travel to/from CEDHA and an allowance of TSH 20,000 (USD 17) per day for out-of-pocket expenses (x 42 days = TSH 840,000 or USD 700). The allowance is for the residential training, which includes three modules per year.

Typically, the MoHSW or a private company pays the fees. The first cohort of students (who have not yet graduated) was sponsored through DANIDA and the MoHSW; the second cohort has not yet been sponsored. Students are supposed to be sponsored by their district, but problems with releasing funds from the MoHSW have resulted in a slow approval process.

Tutors

Tutors are located at CEHDA. Their interaction with students takes place mainly during the face-to-face sessions.

The Head of Health Personnel Education at CEDHA helped launch the distance learning course and is also one of the tutors. He has a masters degree in medical education and training and experience in teaching in distance learning environments. His training in distance learning instruction is quite extensive, and includes attendance at a course on distance learning for 12 weeks at the University of London, participation in an e-learning management course for 6 weeks in Germany, and completion of a teaching management and development class with a focus on e-learning and distance learning in Denmark.

Target Population

The programme is open to HCWs in the public, private, FBO, and non-governmental organisation (NGO) sectors with a certificate, diploma, or degree recognised by the Ministry of Planning Economy and Empowerment (MOPH). The programme will accept even mid-level managers; however, participants should have a minimum of 1 year of work experience, preferably at the district level. They also must be recommended by the district medical officer (DMO), since the MoHSW funds participants. All students referred by the DMO must also meet the outlined criteria for acceptance. Women are encouraged to apply.
The background of the current students is varied and even includes participants from pharmaceutical companies, although most are from the public sector. Since the programme’s inception, there have been only three dropouts, primarily because of the students’ shifting priorities.

**Successes and Advantages**

Advantages of the programme include the following:

- It can train many students with fewer resources than are required for traditional, classroom-based training. One tutor noted that only a few distance learning programmes of high quality are needed to reach large numbers of people.
- It allows students to apply practical skills on the job.
- The programme is not rushed; it provides time to learn, practice, and hone new skills.
- It attracts diverse applicants from both the public and private sectors.
- It was created in response to an identified need: improving the district health system.
- Student assignments are very practical and apply directly to their jobs.
- If the programme is accredited by NACTE, the diploma will be internationally recognised, signifying that graduates have met certain standards.

**Challenges and Disadvantages**

- The programme requires a great deal of support from the coordination office at CEDHA. Currently, feedback to the students is neither adequate nor efficient. A proposed solution is to improve the support, supervision, and feedback loops between students and tutors.
- There is no supervision at the field sites (the students’ regular employers), and it is expensive to send faculty to the sites from CEDHA. The students’ supervisors at the field sites are not really trained to support them in the programme. The programme would like to update the DMOs to serve as supervisors for the students, but would need resources to train them. One solution CEDHA is pursuing is a partnership (it is not clear if there is funding) with Leeds University to develop a checklist for tutors to use when they visit the sites to determine whether students are effectively applying the skills taught in the course.
- Because the programme is so long (3 years), people often change their plans and may decide not to attend all modules.
- The varied backgrounds of the participants make evaluation particularly challenging. Because students are encouraged to engage in projects that are relevant at their sites, it may be difficult to compare all students against one set of criteria.
- Courses are planned to correspond with the cycle of the students’ jobs, which tends to accord with the public-sector schedule. It is difficult to accommodate the schedules of those coming from private companies.
- The MoHSW presently is either not providing funding for the programme or sending it late.
- Course materials are developed locally, and there have been barriers to their creation, including a lack of curriculum development expertise and inadequate funding.
Platforms/Media/Materials Used

A variety of teaching methods are employed in this programme. Case studies, lectures, discussions, role plays, and demonstrations are used to promote participatory learning in the face-to-face sessions. The self-study component includes the use of the internet, and sometimes students are given presentations on CD-ROMs or flash discs (students must supply the CD-ROMs or flash discs).

Beyond the standard nine modules mentioned previously, there are also optional modules that can be developed according to students’ individual needs, experience, and interests. Examples of these optional modules include Health Systems Research, Quality Management, Contemporary Disease Management, Reproductive and Mother and Child Care, Information and Communication Technology (ICT), Leadership, and Applied Epidemiology.

All modules are written by the tutors, after which they are sent to Germany to be refined and printed. Case studies are currently being written for this course that will appear on a computer screen, followed by a quiz. Once answers have been submitted, an immediate response will be given as to whether they are right or wrong. The case study will be followed by a question and answer section in which participants can discuss, by e-mail or in person, the content of each case.

The team was able to view the course materials during the site visit. The binder of course materials received by each student included articles, assignments, and lists of resources. It appeared to be well designed.

Students are recognised for their work by receiving an award or certification that corresponds to the number of months of study they have completed.

Evaluation

No formal evaluation plan presently exists. Tutors noted that they can assess students’ performance based on assignments and in-person contact during the course; however, there is no tracking mechanism in place to evaluate students after graduation. CEDHA is working with Leeds University and another university in Tanzania to develop a more rigorous evaluation strategy.

Site Inspection Comments

All 15 staff members at CEDHA appeared to have computers. They receive internet service free from an NGO in Arusha. Bandwidth is slow. There are 22 computers, all with internet access, and 1 is connected to a printer. The computer lab is air conditioned and appeared to be in good shape. The room is very secure and locked unless there is someone there to monitor use of the equipment. Several other facilities on campus could be used for computer rooms, and in fact, there are plans to expand the computer lab and obtain more computers. This is the most well-equipped ZHRC visited by the assessment teams.

The resource centre is also well equipped with two computers, books, and journals. In fact, an aim of CEDHA’s resource centre is to advise other ZHRCs on how to develop their libraries and resource centres. CEDHA staff provide technical assistance to distance learning programmes, both national and otherwise, on how to develop computerised databases; how to use ICT appropriately in communication and learning; and how to build a resource centre, including identifying materials, reaching HCWs with those materials, and conducting assessments to ensure that materials are used effectively.
How Programmes Are Addressing HCW Shortages

Ongoing health sector and local government reforms result in a high demand for management skills among HCWs working at the district level. This course addresses the need to improve those skills and meet this demand. One tutor suggested that when supervisors are good managers and can provide supportive supervision, there will be less attrition among HCWs.

Future Planning/Vision

Future plans for this programme include the following:

- Provide adequate support for and compensation to coordinators, tutors, supervisors, and assessors.
- Improve coordination between CEDHA and the other participating ZHRCs with regard to administering the programme.
- Improve the support provided to distance learners, including supervision and feedback, while they are not in residence.
- Enhance overall planning for distance learning, such as by developing the learning materials in a timelier manner, creating higher-quality materials, and having more rigorous selection criteria for incoming students.
- Obtain more computers for a larger lab.
- Plan a programme leading to a masters degree in health management and finance.
- Invite new tutors (including foreigners) to participate in the programme to attract students.
- Plan for a programme leading to a masters degree in medical education.

CEDHA is optimistic about the potential of distance learning, seeing it as a cost-effective way to address the lack of training available for HCWs and in turn the shortages of HCWs. Particular mention was made of the potential benefits of distance learning for HCWs in districts and towns with internet access. Other regions, such as Mwanza, are already requesting this programme.

NORTHERN ZHRC/CEDHA: E-COLLABORATION PROJECT USING GLOBAL CAMPUS 21 IN COLLABORATION WITH INTERNATIONALE WEITERBILDUNG UND ENTWICKLUNG GGMBH (InWEnt), MoHSW, AND ZHRCs

Date of Site Visit: June 24, 2008

Data Sources for Summary:

- Interview with one programme manager
- Site observation

Websites: InWEnt: http://www.inwent.org
          Global Campus 21: http://gc21.inwent.org
Description of Programme Activities

The Northern ZHRC partnered with InWEnt to implement Global Campus 21 (GC21) in an e-collaboration strategy with the MoHSW and all seven other ZHRCs nationwide. The project has not been taken up by the MoHSW and the ZHRCs, and for the most part has failed. The experience with this project offers useful lessons for future e-collaboration across ZHRCs, as well as insight on the capacity of ZHRCs to implement distance learning programmes across sites.

InWEnt, whose name translates in English to Capacity Building International, is a non-profit organisation based in Germany ‘with worldwide operations dedicated to human resource development, advanced training, and dialogue’. It has been commissioned by the German Federal Government to ‘realise the United Nations’ Millennium Development Goals’. GC21 is InWEnt’s e-learning platform on the internet, and is based on a learning management system using web technology. It was launched in 2000 and offers online courses and electronic workspaces for organisations.

InWEnt works with the ZHRCs in Tanzania to strengthen human and infrastructure capacities by 1) creating an inventory of training capacities, gaps, and infrastructure; 2) creating refresher and training of trainer (TOT) courses; developing an infrastructure and skill set for e-learning; developing networking mechanisms for ZHRCs, such as steering committees and online communication; and creating plans for the development of long-term training capacity in the zones.

Northern ZHRC worked with InWEnt to develop a strategy for introducing the GC21 platform to create an online community across the MoHSW, ZHRCs, and HTIs. The goals were to increase use of the internet by MoSHW, ZHRC, and HTI staff for collaboration in various work areas (e.g., curriculum development, supervision, evaluation); to create a means for ZHRCs to share best practices and exchange information; and to facilitate communication across the MoHSW, ZHRCs, and HTIs. A secondary goal was to create opportunities for continuing professional development of staff.

Participants from many countries use the GC21 online e-learning courses and virtual workrooms to learn together, discuss and share experiences, and collaborate on projects. The site can be accessed at any time and does not require special software. The interface is available in five languages (German, English, Spanish, French, and Russian), with content in many more languages. InWEnt intends for GC21 to be used by cooperating development cooperation institutions and by private businesses working in international human resources and organisational development. GC21 is financed by a grant from the German Federal Ministry of Economic Cooperation and Development and by the orders of its customers.

InWEnt’s office in Dar es Salaam is the headquarters for implementing the GC21 programme in the East African region. The programme includes short certificate courses lasting approximately 3 months on HIV and AIDS, health systems management, conflict management, sustainability management, and regional economic development. (See the discussion of InWEnt in Section B.2.)

After the Northern ZHRC learned about GC21 and envisioned how it could be used across the MoHSW, ZHRCs, and HTIs, it sent two people to other ZHRCs and the MoHSW to introduce them to e-learning/e-collaboration and the functions of the platform. The ZHRCs were excited about the project and determined that they could make use of the platform in the following ways:

• Communicate with other ZHRCs and the MoHSW academically, scientifically, and officially.
• Receive assignments from the MoHSW.
• Share information, best practices, and challenges of their work.
• Circulate proceedings, meeting minutes, and reports.
• Have synchronous (through a chat function) and asynchronous (through a chat board) discussions.
• Organise meetings.

The ZHRCs received funding from a donor for the installation of computers and internet access at their sites, which ensured their ability to use GC21. Users were expected to have an e-mail address to become members of this online community, whether on a personal or professional basis.

After the ZHRCs had been introduced to the concept and begun signing on as users, Northern ZHRC realised that GC21 was not being widely used. Indeed, the online workspace has seen little use and has failed to be integrated into the organisational culture of the MoHSW and the ZHRCs. One explanation suggested for this failure was a lack of buy-in on the part of the MoHSW, making it more difficult for the ZHRCs to participate. Another reason proposed by staff was that people were not used to interacting electronically and that traditional modes of communication (e.g., face-to-face meetings and telephone) were still being widely used. One staff member interviewed stated that the MoHSW, ZHRCs, and HTIs might be ready to be re-introduced to the idea of e-collaboration.

**Target Population**

The project aimed to target all staff at the MoHSW and all ZHRCs, particularly those engaged in training, the development of training programmes and materials, and the management of training programmes.

**Successes and Advantages**

• The project generated much enthusiasm among the ZHRCs about collaborating in a new way (electronically), indicating that the ZHRCs are open and ready to use e-collaboration.
• GC21 is easy to use and easy for administrators to manage.
• GC21 offers many different functions to suit different uses (e.g., uploading of documents, synchronous chat, asynchronous discussion, archiving of synchronous discussion). There is no limit to the number of users.
• All ZHRCs now have computers and internet access. The Northern and Southern Highlands ZHRCs have the best computers and connectivity. Southern ZHRC has been developing two computer labs and offering computer courses to paying users.
• The curriculum development workspace was the most widely used function.

**Challenges and Disadvantages**

• ICT is not yet fully integrated into the organisational culture of the MoHSW, ZHRCs, and HTIs. In general, e-mail is not the main mode of communication used; at times in-person communication is favoured by staff because they often receive a per diem when they travel. Telephones and short message service (SMS) text are often used to communicate as well.
• Some HTIs lack internet access, and access is unreliable at some ZHRCs. This hinders use of the platform by participants at those sites.
• Some believe the MoHSW needs to take the lead in changing the organisational culture to increase internet and e-mail use. Only then can e-collaboration be a success in the ZHRCs and HTIs.

• Training in basic computer skills and on-site IT professionals are needed. Northern ZHRC has no IT personnel; one staff member interviewed said no ZHRCs had IT staff. The staff member who is the most technologically skilled often bears the burden of solving the computer problems of other staff, fixing the server and restoring internet access, and helping other staff learn the basic functions of computers and computer programmes. For e-collaboration to be successful, staff will need to have ready access to knowledgeable IT professionals.

Platforms/Media/Materials Used

GC21 created a workspace for this e-collaboration project that encompasses several different workspaces designated by topic area, such as curriculum development, supervision, and steering committees. Members can post documents, work on a document together, post comments, ask questions, post an image, initiate meetings, chat with others, and send instant messages. GC21 also offers short and long online courses on a variety of subjects, as well as blended courses with face-to-face components. Course content includes HIV and AIDS–related topics, human rights, education, and e-learning course design.

Site Inspection Comments

See the previous section on CEDHA’s Diploma in District Health Management Programme for observations on the physical infrastructure at CEDHA.

Future Planning/Vision

• One staff member suggested that if Northern ZHRC could procure funding and partner support, it could develop a strategy for re-introducing e-collaboration to the MoHSW, ZHRCs, and HTIs.

• Developing standards for electronic interactivity (either online or by e-mail) is necessary so that users will understand how and when to use e-collaboration.

• Guidelines on electronic communication and the etiquette of its use are needed as people are not used to using computers and interacting in an online community.

• Computer skills training is needed in the MoHSW, ZHRCs, and HTIs to help staff become comfortable with using computers.
WESTERN ZHRC, KIGOMA

Date of Site Visit: June 26, 2008

Data Sources for Summary:

- Interview with one programme manager
- Site observation

Website: None

Description of Programme Activities

Western ZHRC serves two regions: Kigoma and Tabora. In Kigoma, there are two district hospitals and one regional hospital. Only four HTIs exist in the zone—two in Kigoma and two in Tabora. The ZHRC is collocated with Kigoma CATC (a COTC until this year); it used to have a nursing school that was closed several years ago but may be reopened. Roads in the zone are poor, and power outages occur frequently. During electrical storms, the ZHRC must disconnect telephones and computers even though the computers use uninterruptible power supplies.

Western ZHRC provides pre-service courses for CAs in Kigoma through Kigoma CATC. The CATC has been conducting tutorial and practicum sessions for a small number of students in the distance learning CA to CO upgrade programme. Western ZHRC also provides a venue for the final qualifying examination for distance learning students. Space for the distance learning students, particularly classrooms and hostels, is problematic as the current rooms provide enough space to house only residential pre-service students. When distance learning students come for their tutorial and practicum sessions, the space is inadequate. The resource centre lacks materials and a specific person to maintain it.

Challenges and Disadvantages

- Lack of tables for computers
- Unreliable power supply
- Financial constraints

Site Inspection Comments

Internet access had not yet been implemented in Western ZHRC, Kigoma, at the time of the site visit, although space for a computer lab had been identified. There were ten computers earmarked for use at Kigoma, but they had been in their packing crates for 2–3 months. The reason given was a lack of furniture for the lab. Kigoma has no VSAT installed, so it must rely on the local internet infrastructure available in the Western Zone. The local internet infrastructure (and its speed) appeared to be adequate given the team’s observations at AHADI, a local NGO, and at internet cafés, and the connective speeds provided by a local hotel. As noted, however, frequent and lengthy electrical outages occur in this zone.
ZANZIBAR MOHSW CONTINUING EDUCATION UNIT (CEU)

Date of Site Visit: June 23, 2008

Data Sources for Summary:

• Interview with one programme manager
• Interviews with two IT specialists
• Site observation

Website: None

Description of Programme Activities

The Zanzibar MoHSW’s CEU is forward thinking about its capacity to conduct distance learning programmes. As noted in the discussion of the AKU EN to RN programme in Section B.2, the CEU plays a role in supporting students in that programme. The CEU is currently working to improve the programme for students and to involve more partners in its coordination, including DANIDA, the African eResource Centre Department, Elluminate software company, and the Zanzibar Nurses Association (ZANA). The tutors involved in the programme will no longer have to travel from Dar es Salaam to provide face-to-face sessions, but will deliver content via the Elluminate virtual classroom.

The Zanzibar MoHSW is also aiming to create an e-collaboration project. One goal of this project is to accelerate the development of health systems and human resources through the application of online collaboration technology. Another goal is to build sustainable MoHSW partnerships, infrastructure, and technical capacity to manage, implement, and evaluate e-learning and e-collaboration health applications. The project will be implemented under the CEU and is consistent with the CEU’s Health Sector Policy, Health Sector Reform Strategic Plan, and Human Resources for Health Development Plan.

A few years ago, the U.S. Agency for International Development (USAID) funded a 3-year internet subscription project in each district for Zanzibar MoHSW and local government facilities. An inter-ministerial team of IT officers from Zanzibar’s three ministries (MoHSW, Ministry of Education and Vocational Training, and Ministry of State [President’s Office] Regional Administration and Local Government) has been coordinating training, maintenance, and management for this project, and will need to develop a proposal for its continuation. If new computers were obtained under this project, they would support educational opportunities for workers in the three ministries, although an evaluation of current projects would be necessary to determine the needs for a new programme.

Zanzibar MoHSW has established an online learning management system that uses Moodle for asynchronous learning and Elluminate videoconferencing/virtual classroom software for synchronous learning that allows students and tutors to interact. Students need a computer; a headset with microphone and speakers; or in a group, a polycom conference microphone and speakers that allow a similar classroom environment to be provided for up to 30 students. Elluminate will be used in the RN upgrade programme, as well as for other distance learning pursuits of the Zanzibar MoHSW.

Zanzibar CEU has a computer lab with ten computers. The room is air conditioned and is well secured, remaining locked when not in use. Students enrolled in the AKU programme did not mention using this lab, however. Zanzibar also has resource centres based at district hospitals and primary health care centres, which in the past have contained second-hand computers obtained through a USAID grant, but none of these computers are currently functioning. The CEU would like to write a grant to re-stock the resource centres, which are
currently lacking both computers and other ICT equipment; however, it is difficult to obtain grants to fund hardware.

Zanzibar’s Continuing Education Committees (CECs) manage District Health Resource Centres in ten districts that support HCW training and information. These centres have textbooks, journals, anywhere from one to five computers per centre (although most are old and in disrepair), and internet access. Internet access was provided to these centres and the resource centre at the College of Health Sciences by the Zanzibar Joint Ministries Internet Project (ZJMIP), supported by USAID and DANIDA, allowing the centres to have wireless service. Additionally, two resource centres (Mianzini and Kivunge) have a laptop, an LCD projector, a screen, polycom speakers, and a microphone, as well as a miniature solar panel to give distance learning students access to live web-based sessions broadcast from AKU in Dar es Salaam for the nurse upgrade programme. Distance learning students can also access computers and the internet at the Mianzini Zanzibar Town Resource Centre (which is the zonal resource centre) and Kivunge/North A District. The CEU hopes to recruit students from Pemba for the AKU nurse upgrade programme and to launch a resource centre in the Chake district of Pemba.

Target Population

The Zanzibar MoHSW CEU is responsible for coordinating distance learning and continuing education activities for HCWs in Zanzibar.

Successes and Advantages

The activities of the Zanzibar MoHSW CEU:

- Strengthen partnerships among organisations that share health and human resource priorities.
- Use appropriate technologies for Zanzibar in terms of bandwidth.
- Increase access to education and training for HCWs in Zanzibar.
- Increase the CEU’s technical capacity to manage distance learning programmes.
- Establish a high-capacity network, an online learning management system, and live collaboration applications that the MoHSW can use for other learning purposes in the future.

Challenges and Disadvantages

- The MoHSW lacks the organisation, human resources, and technical skills needed to manage an IT infrastructure to support distance learning programmes and software.
- The MoHSW also lacks an IT policy.
- There is increased demand from nurses and other professionals to be trained quickly.
- Some CEU staff lack the management capacity to implement distance learning programmes.
- Space and equipment for e-learning and teaching are inadequate at resource centres.
- Equipment such as computers, LCD projectors, and screens is inadequate at some sites (especially in the districts).
Platforms/Media/Materials Used

As noted, the MoHSW plans to use the Moodle and Elluminate software programmes for the EN to RN programme and eventually for other e-learning and distance learning programmes.

Evaluation

ZANA is a non-governmental professional association in Zanzibar that advocates for nurses’ development and ethics. One of its major roles is to ensure the delivery of quality health services by practicing nurses in Zanzibar. In this role it is responsible for evaluating and monitoring the progress of nursing programmes at colleges and training institutions in Zanzibar so that better results can be achieved. Its monitoring activities include monitoring of distance learning programmes for nurses. The programmes will also undergo internal evaluation to determine their achievements and challenges. Additional evaluation will take place through meetings in which stakeholders will discuss the progress of the project.

Site Inspection Comments

The Mianzini Resource Centre in Zanzibar Town had ten computers and two IT personnel. The computer room appeared to be in good shape and was kept locked when not being monitored. At the time of the site visit, the internet was down. A few days prior to the visit, power had been off in Zanzibar for 4 weeks, although it was noted that this was unusual.

How Programmes Are Addressing HCW Shortages

The current distance learning programme conducted in conjunction with AKU provides mutual benefits for employers and employees as well as clients/patients because it allows HCWs to upgrade their knowledge and skills while remaining at their workplaces.

Future Planning/Vision

The Zanzibar MoHSW CEU plans to strengthen the Mianzini Resource Centre by adding at least two classrooms and a production unit for printing and photocopying, repackaging teaching and learning materials, burning CDs and DVDs, adding a darkroom and film editing suite, opening an internet café, and introducing user fees. The CEU believes this facility could be a centre for developing and distributing materials to District Health Resource Centres in both Unguja and Pemba.

In the past, a practice-based distance learning course for community health nurses was coordinated by the College of Health Sciences. One programme manager said the MoHSW would like to revive this programme, but would need funding to do so. The CEU would also like to initiate other distance learning courses, such as bachelors and masters degree programmes in nursing, and to create distance learning courses targeting other cadres, such as those working in epidemiology, environmental health, and community health. In addition, the CEU would like to support telemedicine programmes for HCWs in Zanzibar.

Zanzibar CEU and district CECs are planning a computer lab with 40 workstations. The lab will be staffed by a librarian who has received specialised training in a 2-year diploma course in Bagamoyo. CECs have been tasked with assessing HCW training needs, as well as planning and implementing training activities. CECs are well established and have been functioning in this capacity since 1992. One staff member suggested that the CECs may be a
good mechanism for developing distance learning opportunities for HCWs in the districts. It is worth noting, however, that the proposed improvements to the resource centres and development of the production unit are still unfunded.
B.2 Site Visits and Reviews of Other Distance Learning Programmes in Tanzania

This section summarises site visits and reviews of the following distance learning programmes in Tanzania:

- Aga Khan University (AKU) Tanzania Institute for Higher Learning Advance Nursing Studies Programme in Dar es Salaam: Enrolled Nurse (EN) to Registered Nurse (RN) (page 196)
- AKU Advance Nursing Studies Programme in Zanzibar: EN to RN (page 202)
- AHADI Institute, Kigoma (page 208)
- Harvard University HIV Online Provider Education (HOPE) webcasts (page 210)
- Ifakara Health Institute, Ifakara (page 212)
- International Institute for Communication and Development (IICD), Tanzania (page 213)
- InWEnt, Global Campus 21, Dar es Salaam (page 215)
- Muhimbili University of Health and Allied Sciences (MUHAS) (page 217)
- Open University of Tanzania (OUT), Dar es Salaam (page 219)
- Phones for Health (page 221)
- Tanzania Education and Research Network (TERNET) (page 223)
- Tanzania Global Development Learning Centre (TGDLC) (page 226)
AKU TANZANIA INSTITUTE FOR HIGHER LEARNING ADVANCE NURSING STUDIES PROGRAMME IN DAR ES SALAAM: ENROLLED NURSE (EN) TO REGISTERED NURSE (RN)

Date of Site Visit: June 19, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interview with one IT specialist
- Interviews with four students
- Interviews with two tutors

Website: None for programme (general website: http://www.aku.edu/SON/)

Description of Programme Activities

The AKU distance learning EN to RN upgrade programme was launched in 2006 with a grant from Johnson and Johnson, Inc., a U.S. corporation. The university has a traditional classroom-based nursing programme that began prior to the distance learning programme. Distance learning students are located at three sites: Dar es Salaam (currently 46 students in the 2006 and 2007 cohorts and 30 in the 2008 cohort), Zanzibar (total of 24 students—11 enrolled and 14 about to graduate), and Morogoro (currently 11 students in the 2007 cohort and 10 in the 2008 cohort). Although the programme is conducted and coordinated through AKU in Dar es Salaam, the Zanzibar site functions with support from the Zanzibar MoHSW CEU and ZANA (see the discussion of Zanzibar MoHSW CEU in Section B.1), while the Morogoro site is supported by the MoHSW national CDE. More information on the Zanzibar programme is provided below.

Structure

This is a 2-year diploma course. For the first 2 weeks, students are trained in basic computer skills. Although the course is currently print-based, students are expected to use computers for typing papers, locating resources online, and occasionally sending/receiving e-mail. The course is mainly self-study through print-based media, with face-to-face and practicum components. During the face-to-face component, students and tutors meet twice a month in a classroom environment (the traditional residence programme meets twice a week). Students in Dar es Salaam meet on the AKU campus, and tutors travel to Zanzibar and Morogoro to meet with students 2 days a month. The original purpose of the face-to-face component was to allow students to ask questions about content, although currently these sessions are more lecture-based. One programme staff member noted that this component allowed the tutors to coach and guide students. Preceptors oversee the practicum component and communicate with the tutors through in-person meetings. There is a 20-week practicum at Muhumbili Hospital on Thursdays and Fridays every other week; there is also a 3-week community practicum during the first year. Programme administrators stated that they are currently experimenting with Elluminate videoconferencing/virtual classroom software for the classroom-based portion of the course so that tutors will not have to travel to Morogoro and Zanzibar to instruct students face-to-face.
Cost

Tuition is TSH 1,360,000 (USD 1,133) per student for the entire programme. AKU and Johnson and Johnson, Inc. give scholarships to about 60 per cent of students; the amount provided varies among students. Some students’ employers pay a proportion of their tuition.

Tutors

The programme has seven tutors. Students and tutors correspond by phone and, according to programme staff, rarely through e-mail. Students and tutors also may meet informally outside of class to address questions about content (either one-on-one or in groups), and all students interviewed noted that tutors were always available to meet. The onus for requesting a meeting falls on the student. A tutor said, ‘They must be the ones to take the initiative.’ According to one tutor, none of the tutors had previous experience with teaching in a distance learning programme. At the start of the programme, the programme manager conducted a session for all tutors on how to prepare the tutorial letter (essentially the course syllabus), but did not mention specific distance learning training for tutors. When tutors travel to Zanzibar and Morogoro for face-to-face sessions, their travel costs are covered, and they are given a lunch allowance. Both the programme manager and tutors interviewed stated that this amount was insufficient to cover the expenses.

Target Population

This programme is designed to upgrade ENs (who hold certificates) to RNs (graduating students receive a diploma). Both programme administrators and tutors noted that students wishing to be admitted need to have a good basic education, especially in English-language comprehension and writing skills, since ‘95 per cent of the course is self-study’ and in English. Students must take an entrance exam to be admitted, and some students drop out during the selection process. The programme is advertised in the Guardian newspaper, and there is an ‘open house day’ when students can come to AKU to learn about the programme. Programme administrators also noted that word of mouth is used to recruit students.

Platforms/Media/Materials Used

The materials for the self-study component include a study guide and workbook for students. There is also a facilitator guide for tutors. The printed materials are developed by AKU in Nairobi, Kenya, and shipped to the university in Dar es Salaam to be distributed to students in hard-copy form.

Printed materials are kept in the library at AKU, and some are distributed to Zanzibar and Morogoro. Modules are accessed through the library and not distributed individually to students. The tutorial letter, or syllabus, contains objectives and questions for each topic. The objectives are based on MoHSW guidelines for RN competencies. The 2-year course contains approximately 18 modules. The face-to-face sessions use videos, PowerPoint slides, and handouts.

Students are also given a list of materials they are expected to acquire themselves, such as books and items off of websites. Students often seek textbooks and other resources at the AKU library. One student said, ‘The library is a big resource; I come here on my days off.’ Students also use computers and the internet to find websites that are referenced in the tutorial letter. Some resource information is not supplied directly; rather, students are given a topic and instructed to find resources on that topic. Students noted that it can be challenging to find resources beyond what is available in the library. One student suggested that the
course materials overall are not very useful, stating, ‘Demonstrating is a better way to learn—like in the practicum.’ Three of the four students interviewed found the face-to-face sessions very useful and wished that more would be included in the programme; once a week (or four times a month) was stated as ideal.

**Successes and Advantages**

- AKU has little space on campus to hold classes, so distance learning helps alleviate this problem because students are off site most of the time. Despite this advantage for the university, most students said they came to the campus often to study at the library, use the computers, or work with classmates. Thus the advantage for students in Dar es Salaam comes from the flexible structure of the programme (self-study, more time out of class to work and care for family) rather than the fact that it is a ‘distance’ programme.
- There is a high demand in Dar es Salaam for programmes that provide an upgrade from EN to RN. Both programme managers and tutors interviewed said the programme helps meet this high demand. In its first year, however, the programme had 120 applicants but could accept only 40.
- All four students interviewed expressed a high level of enthusiasm for distance learning because it allows them to work and study simultaneously and also have time for family. Tutors were enthusiastic about distance learning as well. One tutor said, ‘Faculty really want distance learning to “take off”.’ All four students interviewed said they liked the programme overall and would recommend it to friends. Two students noted that if students had a computer to use—for example, at their workplace—they could gain computer skills, which were seen as an advantage. If students did not have free and ready access to computers, they found it challenging to gain skills in using computers and the internet. Students enjoyed the face-to-face component: ‘Face to face is very, very helpful. I don’t want to miss a single day.’ Students also noted that AKU has good reputation, which was a reason they chose to attend the programme.
- Students interviewed said they had gained confidence in their ability to learn as a result of the structure of the distance learning programme. One student said that studying alone ‘prepares you well and builds confidence and increases level of understanding of research’. Students also appeared to learn from each other. Those interviewed noted that they met with other students in small groups close to where they live to study and discuss content. Two students said they interacted with other students about three times a week in these small groups.
- Students often cited cost as an advantage of distance learning. One student said she could save money on dalla dalla fares as she did not need to come to class every day. Another said she would not be able to afford to pay for school unless she could continue to work. Programme staff also said that distance learning is less expensive than traditional programmes, although they did not have any cost data available.
- Two students noted that they had applied to the programme because acceptance was less competitive than in a traditional, classroom-based programme.
- Many traditional programmes require students to live in residence at the training institution far from their homes. One tutor interviewed said, ‘Uprooting the learner creates a vacuum not only in their workplace but in their family. Distance learning is better socially.’
• Retention of nurses in the country was cited as an achievement by the two programme managers interviewed because some students will travel to the UK, Kenya, or Uganda to upgrade their nursing skills.

• The two programme administrators interviewed also cited the programme’s low dropout rate (only three dropouts over the past 2 years—two with family problems and one who died); funding for students from Johnson and Johnson, Inc.; and the programme’s structure, which allows students to remain in their workplace and with their families.

• Well-liked faculty were cited by the students interviewed, who noted that tutors are very responsive to their needs.

Challenges and Disadvantages

• Students have a poor foundation in basic education. Programme staff and tutors commented that the Tanzanian educational system is not as well developed as that in Kenya or Uganda, so students struggle with the English language. One programme staff member commented, ‘They don't have a good basic education.’ Also, since most students’ first language is Kiswahili or another local language, their performance in the course suffers as a result of their limited English-language skills. A tutor mentioned one solution that is used in teacher training in Tanzania—a ‘crash programme’ whose purpose is to improve teachers’ language skills. As the programme materials are in English, one tutor said, ‘It is critical to address language skills, especially writing skills.’

• With only five computers in the library for more than 300 students in the School of Nursing and the School of Medicine at AKU, distance learning students have difficulty gaining access to these computers. Students mentioned that there are often lines for the computers. ‘Sometimes a person is on the computer, but they take longer than 30 minutes (the limit if someone is waiting), and no one is there to enforce the time.’ The library is open until 8 PM, but there are often no computers available when students go to the library to study. Many students spend their time at an internet café to conduct internet research and find required resources. However, the service is slow and expensive, costing TSH 1,000 (USD 0.83) per hour.

• Students said they need to develop typing skills but cannot do so without computer access. Students also noted that they struggle to find internet resources because of their lack of skills in searching the internet. Students did not appear to use e-mail often. Two students noted that they do not use e-mail because it ‘takes too much time’ and is ‘a waste of time because it’s too slow’.

• Most students stated they did not know how to use Microsoft PowerPoint or Excel, but said they could perform the basics in Microsoft Word. Students were not familiar with Adobe PDF. Although training in computer skills is provided at the start of the programme, students cannot practice enough because of limited access to computers, and thus they stated that they could not improve those skills very much during the course. In addition, most students interviewed said they did not find the initial computer training useful. Students noted that they were encouraged to take an additional computer skills class before entering the programme, but only one of the four students interviewed had done so. That student said she felt the course offered at the start of the programme was useful for her work in the programme, but she needed more skills. According to the programme managers and the IT specialist interviewed, the course at the beginning of the programme revealed that many students had never touched a computer before. The course taught the basics: how to use a mouse, open
documents, get on the internet, open an e-mail account, and check and send e-mail. The IT specialist interviewed noted being asked by students and tutors for help with computer basics; according to students, they also asked the librarian for help with computers. The IT specialist said, ‘They are starting from scratch…teachers need some support too.’ Very few students have their own computer, remarked the IT specialist, and no students interviewed owned one. Students interviewed said that some students own and use flash discs (memory sticks) to store documents or research that they download from the internet.

- Limited internet access is a challenge for students. Only three of the five computers in the library have internet access, limiting students’ ability to locate resources and information. The four students interviewed said they have limited skills in using the internet. One tutor stated, ‘They are not good at internet searching or finding libraries online.’ Both students and the IT specialist said the internet is slow. The internet is on a local area network (LAN) and shared with AKU hospital. According to the IT specialist interviewed, the internet service provider (Elink) says the speed is 64 kilobits per second, but when the actual speed is tested, it is much slower (36 kilobits per second). The IT specialist stated that Elluminate may be difficult to use for videoconferencing as it requires more bandwidth.

- There is only one IT support specialist for the School of Nursing and the School of Medicine. When interviewed, this IT specialist interviewed claimed that ‘students and teachers need training in (computer) basics’. The IT specialist works with hardware as well as software. One issue cited involved the challenges of improving technology amid heavy bureaucracy: ‘Buying equipment takes a long time due to bureaucracy—once a decision is made and funding is approved—but difficulties to actually get it arise and delays getting the equipment for a long time. [I] have to go through several steps to get the computers even though there is money for them.’

- Students, staff, and tutors complained that because they need to send resource materials such as books to Zanzibar and Morogoro, they have a shortage of resources in their libraries. (Note that when students in Zanzibar were interviewed, they also cited a severe shortage of resource materials, such as books, even more so than in Dar es Salaam. This appears to be a programme-wide problem.)

- Because tutors must travel to Morogoro and Zanzibar and teach for 8 hours a day, there is a shortage of tutors willing to do this. In addition, the per diem provided is insufficient, and one programme staff member noted, ‘Travelling long distances is not safe.’

- Receipt of materials from Nairobi has proved challenging. Materials arrive late to students’ resource libraries, sometimes after the course has begun. The programme managers said they did not understand why the materials were consistently delayed in Nairobi.

- Self-directed learning is new and difficult for some students. Distance learning requires students to be self-motivated to study. Tutors and programme staff interviewed said that students in Tanzania are not used to being self-motivated learners. One tutor said that students did not prepare questions for the face-to-face sessions, rendering these sessions more lecture-based and less interactive. The tutor stated that students needed training in how to learn through distance learning. Another tutor said, ‘Students need study skills that will help them find resources on their own.’ One student stated, ‘You are supposed to be very serious if you want to understand; you are supposed to be very active.’ Another student noted, ‘Teachers have so much more information than me, I don't know how to find it.’ Time management is a real issue for students, who struggle with how to balance work, home life, study, and
practicum activities. Tutors noted that distance learning students’ performance was low overall and that this, combined with poor English-language skills, causes ‘the weaker ones to sometimes drop out’. However, a follow-up discussion with the coordinator of this programme revealed that distance learning students performed better than traditional students on their national exams.

- One tutor stated that preceptors were not oriented well to their role and did not know what the students were studying. One suggestion was that preceptors receive more training and guidance in their support for students. Another barrier to good preceptors is that they are not compensated.

- Curriculum materials do not adequately reflect students’ contexts. Students interviewed noted that they do not have enough ‘procedural equipment’ at the hospital where they do their practica, so they cannot practice some of the procedures in the books used in the programme. One student said there are case studies in the study guides from Nairobi that do not apply to Tanzania’s context. One student said the clinical practicum should be better coordinated with the didactic component.

- Tutors interviewed said that students are somewhat isolated from other classmates and have no one with whom to compare themselves, which could cause them to lose motivation to study. Students interviewed said it is difficult to meet with other students, although, as noted above, some students often arrange informal meetings. They also use the phone or SMS, and occasionally e-mail, to arrange these meetings.

- Students noted that teachers sometimes miss a day of teaching the face-to-face sessions but do not make up the time. All students interviewed felt frustrated by this since they have so few opportunities for such sessions, which they value highly. One student interviewed said that during the 3-week community field-based practicum, her teacher did not attend, despite telling students she would do so. While the students were in the field, the teacher called them sometimes from Dar es Salaam to give them guidance, but the students felt they were largely on their own in the field, making it difficult to know what they were supposed to be learning.

**Evaluation**

No formal evaluation of the AKU programme has been conducted. Students sit for the MoHSW exam at the end of the programme, and in addition, they must pass an exam given by AKU each semester to advance to the next semester. Exams include oral clinical, practical clinical, and theoretical components. Tutors said that during the face-to-face sessions, they are also able to evaluate students through their participation.

One tutor said that exam scores of distance learning students were lower than those of traditional students but satisfactory. Another said the students are ‘averagely’ prepared, but less so than traditional students when they graduate. This tutor said it is not clear why this is the case, but it may be due to their lack of skills in self-study and less exposure to tutors.

**How the Programme Is Addressing HCW Shortages**

Students enrolled in the programme can continue working in their jobs in health facilities, and they also help staff facilities through their practica. Programme staff noted that when students graduate, many will continue working and obtain promotions in the same workplace; some will become research coordinators in support of a health programme; and those working in private facilities may go to public facilities (which pay more). In these ways, graduates continue to staff health facilities in their communities.
One tutor commented that the programme increased access to learning that enables HCWs to advance their skills, which is especially important given that there are so few schools of nursing. Also, the tutor noted, the highest proportion of nurses in Tanzania are ENs (there are 11 000 ENs, only 8 000 of whom have as yet received a certificate), so it is important that AKU’s programme targets them. This tutor said, ‘Nurses have been demanding upgrade opportunities for a while, but opportunities are limited. Now the door is open.’

When students interviewed were asked what they planned to do when they graduated, all said they would either continue to work or study in the field of health. Specifically, they said they would seek a promotion in their current workplace, go to a developed country to work or study further, or pursue an advanced degree in their field in Tanzania.

Future Planning/Vision

The MoHSW has asked that the programme double its enrolment for next year in an effort to scale up the number of HCWs trained and upgraded. According to one programme manager interviewed, this mandate comes from the MMAM report. As one tutor commented, ‘[We] need people who can move distance learning forward in this country.’ Other suggestions for expanding distance learning programmes included increasing the number of centres for distance learning around the country and forming a group of national distance learning leaders to provide strategic direction for the scale-up of HCW training through distance learning.

Students pointed to the need for more books and resources in the library and for more computers and computer training. In fact, future plans noted by programme and IT staff interviewed included moving the library to a new location where it can be expanded to increase resources and materials and installing 13 additional computers in the library for nursing and medical students.

Tutors and students suggested that the programme needs to create more opportunities for face-to-face sessions to motivate students and make them feel connected. Students also mentioned that they would like to see the community fieldwork component improved, noting specifically that tutors should join them during this time and that free transport to the field sites should be provided.

One tutor suggested that a programme leading to a bachelor of science of nursing degree through distance learning be initiated in the near future. This tutor had travelled to South Africa to observe similar distance learning programmes at several universities and felt confident that one day AKU could have a similar programme.

AKU ADVANCE NURSING STUDIES PROGRAMME IN ZANZIBAR: EN TO RN

Date of Site Visit: June 23, 2008

Data Sources for Summary:

- Interview with one programme manager
- Interviews with two IT specialists
- Interviews with 12 students

Website: None for programme (general website: http://www.aku.edu/SON/)
Description of Programme Activities

As discussed in the previous section, AKU’s distance learning programme is designed to upgrade ENs to RNs. The Zanzibar site, while coordinated through AKU in Dar es Salaam, functions with local support from the Zanzibar MoHSW and ZANA. It currently has 25 students, 14 of whom were about to graduate at the time of the site visit.

Structure

The course lasts 2 years. During the first 2 weeks, the students are trained in basic computer skills. Although the course is currently print-based, Zanzibar is advocating for an e-learning component so students can collaborate with tutors and other students through Elluminate, a videoconferencing software package. The students come to ZANA or another rented location in Zanzibar town for face-to-face meetings with tutors. The original purpose of these sessions was for students to ask questions and present challenges, but more recently they have also been receiving lectures. Students correspond with their tutors by e-mail and telephone since none of the tutors are located on Zanzibar (all are in Dar es Salaam at AKU). The practicum component is conducted at Mnazi Mmoja Hospital, where most of the students are employed.

There is one student coordinator in Zanzibar, whose role is to check e-mail daily for any updates from AKU in Dar es Salaam or Nairobi, Kenya. He communicates timetables and assignments to fellow students and occasionally goes to Dar es Salaam to pick up materials or items for the course. He is unpaid, and students elected him to the post.

Students have independently formed study groups to help one another learn the materials. There is one group of students in town and one outside of town (in Kufuje) that each meet every Wednesday and Thursday. They divide the information from their books into research objectives, and everyone is assigned a topic to research and present to the group the following week. Sometimes students pay out of pocket to bring in an expert to teach them a particularly difficult topic (this is done independently of the AKU programme, but is in support of their learning while they are enrolled in the programme).

Cost

Tuition is TSH 1,360,000 (USD 1,133). Zanzibar students usually pay about 25 per cent of the tuition, while 60 per cent is covered by the Zanzibar MoHSW. The remaining amount is covered by a scholarship from Johnson and Johnson, Inc. Although the MoHSW is responsible for 60 per cent of the tuition, it has been unable to release the funds to AKU. Some students interviewed stated that AKU’s financial officer was frustrated by the government’s inability to pay their tuition, and they feared that the university might not allow them to graduate.

Additional costs cited by the students included books (approximately TSH 25,000 or USD 21), notes (around TSH 5,000 or USD 4), internet use (TSH 1,000 or USD 0.83 per hour), copy services, secretarial services (to type papers if students cannot do so themselves, at TSH 1,000 per page), and dalla dalla rides. Almost all students interviewed said that distance learning is very expensive because of these added costs, which they were not informed about at the start of the programme.
Tutors

As noted, tutors must travel to Zanzibar from Dar es Salaam to conduct face-to-face sessions with students. Therefore, instead of being spread out as they are for the AKU programme in Dar es Salaam, face-to-face sessions are held back to back. Students have limited in-person contact with tutors. Students interviewed noted that when they e-mail or call their tutors, the tutors usually respond. Overall, however, students said they did not have enough time with their tutors.

Target Population

This programme is designed to upgrade ENs (who hold certificates) to RNs (graduating students receive a diploma). Prior to starting the programme, students need to have a good basic education, especially in English-language comprehension and writing skills. The course requires that students be self-motivated and do a great deal of self-study. Students must take an entrance exam to be admitted, and some drop out during the selection process. According to one programme administrator in Zanzibar, AKU originally planned to include nurses on Pemba (a neighbouring island) in the programme. Zanzibar MoHSW received many applications from Pemba, but the day before the interviews, AKU cancelled them, saying the programme could not be offered on Pemba. The assessment team did not ask AKU to confirm this.

Successes and Advantages

- The programme allows flexibility for students, who can study and work at the same time while also spending time with their families, as they can remain at home instead of being resident students. One student said he would be unable to upgrade in a traditional programme, so this was his only option.
- Students said that participating in a distance learning course made them feel more self-confident. Some students interviewed stated that when they found the answer to a question themselves, without the help of a tutor, they felt more prepared for their work.
- Students expressed favourable opinions of the programme. Despite the challenges discussed below, one ex-tutor noted that with distance learning, the ‘purpose of learning is more apparent’. One student explained that students’ face-to-face time with tutors is more valuable because the time is not wasted as it often is in traditional programmes.
- One student explained that because distance learning can use the internet as a learning tool, students improve their computer skills.
- English-language skills can also be improved, some students stated, as the programme is presented in English.
- Students said that their opportunities to gain entrance into upgrade programmes are limited, and it is difficult to advance otherwise. Students stated that the programme costs less than traditional programmes, and acceptance is easier. Many students cited these as reasons for applying. While the cost of tuition is low, however, students feel that the additional costs enumerated above are too high.
- Students overall thought the course materials were good.
- Students mentioned that they liked collaborating and teaching each other. As one stated, ‘This is adult education, we only use the teacher when we have a hard question.’
• Students said they would feel motivated to obtain even more training after participating in the programme.
• Only two students have dropped out thus far, and this was at the beginning of the programme.
• Graduates can practice in many places in the world because the programme is NACTE accredited, and AKU has a good reputation internationally. (While students saw this as an advantage, it is worth noting that it is not an advantage with respect to increasing the numbers of HCWs in Tanzania)

Challenges and Disadvantages

• The course materials come from Nairobi to Dar es Salaam and are then forwarded to Zanzibar, which causes many delays in their delivery. Furthermore, the content is not always relevant to the Tanzania/Zanzibar context. For example, computer-assisted tomography (CAT) scans are not available on Zanzibar, yet students are taught about them. The same is true of certain kinds of lab tests. In addition, some case studies are derived from Uganda and are not applicable to the Zanzibar context.
• Students struggle with the curriculum, as it is all in English. Some students suggested that some of the course materials be created in Kiswahili. One programme administrator mentioned that AKU would like eventually to have dubbed-over versions of its training materials in Kiswahili, but there are no resources for this purpose.
• Few curriculum materials and reference books are available to students. Only one copy of the reference manual is provided for all 24 students. It is too expensive for students to print out the entire manual, so instead they must take turns using it. One student said that some students think AKU is offering the programme in Zanzibar only to make money, and this is why inadequate numbers of books are provided. Just one shelf of one bookcase in the library contains all the materials for students. The student coordinator’s job is to ensure that the materials are taken out of the library briefly or not at all so they will be available for the students to use at ZANA.
• Students cannot access computers at their workplaces, so they have a difficult time communicating and sending assignments. One student said, ‘I only used the computer at orientation and then never again.’ ZANA allows students to use its one computer when the secretary is not using it; the secretary helps them with computer questions. Originally, students received three computers from AKU in Dar es Salaam, but the computers broke after 3 months and were not replaced, despite students’ requests for new equipment. Many students go to internet cafés to access computers, but they noted that it is expensive both to get to a café by dalla dalla and to use the equipment. One solution to the need for computer and internet access, which was tried for 3 months, was to rent an internet café twice a week for students’ use. Students were then able to go to the café free of charge. Students interviewed said this arrangement worked well, but it ended after 3 months because of the high cost (according to an ex-tutor). As it is now, students lack internet access to obtain online resources required by the course. AKU asked the College for Health Sciences to allow students to use its facilities, but the college demanded TSH 2,000 (USD 1.70) per hour for use of its computers.
• Some students have no e-mail address, so they must rely on other students to send assignments, ask questions of tutors, and the like. Some students lack the skills needed to search for resources online, which impedes their research efforts. Students
also mentioned that it is difficult to find websites, so students will often go together to
an internet café to help each other out.

- The programme manager interviewed noted that, as discussed above, students in
Pemba (an island where there is a great need for this programme) had been told to
apply; however, they were later informed that no one would be going to Pemba to
interview them, nor would any students from Pemba be accepted into the programme.
This notification occurred after students had already paid their application fees and
showed up for the interviews.

- There is no operations budget for Zanzibar. AKU does not assist students in arranging
space for face-to-face sessions, for a library, or for a computer or other equipment, or
payment for the coordinator. ZANA is very far from town, and has few desks and
little space for face-to-face interactions. One student said it is difficult to find space
for face-to-face sessions; students must search every month for a venue for these
sessions. Often they are able to obtain donated space in town, but sometimes AKU
must pay to rent the space.

- Interaction between students and tutors and between the programme and students is
limited. Students rarely have contact with their tutors; aside from the face-to-face
sessions, students interact with their tutors only if they initiate the contact. In addition,
their tutor is not the same each time. Thus students are unable to form any relationship
with their tutors. Overall coordination between the mainland and Zanzibar in this
regard is poor and has an adverse impact on the programme. Students feel they need
an on-site tutor in Zanzibar. AKU in Dar es Salaam currently relies on the student
coordinator mentioned earlier to coordinate between Dar es Salaam and Zanzibar, but
as noted, he is not paid for any of the work he does, which involves many hours per
week.

- Preceptors lack guidance on their roles and responsibilities. Sometimes students never
end up working with their assigned preceptors, and occasionally preceptors have been
the students’ peers, so they have not contributed to the students’ acquisition of
knowledge and skills. There is also a shortage of preceptors, so students have instead
looked to supervisors for help in learning skills. Students also felt that sometimes
preceptors failed to help them because ‘they have no heart’ or ‘they are too busy’.
Students and an ex-tutor suggested that the preceptors should be paid.

- Students lack support in their studies from their workplaces. Some students stated that
their supervisors would not allow them time from work to attend face-to-face sessions
because of clinic shortages. Some students felt that in some cases, their supervisors
purposely scheduled them to work at times when they had face-to-face sessions to
attend. This lack of support may be related to the fact that the Zanzibar programme
received only four applications for the coming year (AKU in Dar es Salaam said there
were no Zanzibar applications).

- The Zanzibar MoHSW agreed to cover some of the students’ expenses, but has been
unable to pay AKU on time. One student said he is concerned that the students will
not be allowed to graduate if the MoHSW does not make these payments.

**Platforms/Media/Materials Used**

The programme uses primarily print-based materials developed by AKU in Nairobi. The
programme manager interviewed noted that the materials have been adapted to be in line with
mainland MoHSW requirements, since the students take the MoHSW exam at the end. The
course includes approximately 18 modules. Materials include a study guide for each module,
a workbook, a tutorial letter that contains objectives and questions for each topic, a workbook
for the practica that outlines the objectives for each of the 20 weeks of clinical practice, and a guide for faculty.

The Zanzibar programme is testing the Elluminate e-learning programme for this course. USAID provided internet connectivity and computers to several health care facilities and to District Health Resource Centres in Zanzibar so students can access the e-learning programme.

Teaching methods in the face-to-face sessions currently include discussion, lecture, and use of PowerPoint slides. The internet is used for references, although as noted above, internet access is problematic, and the main reference book is at the library for all students to share.

**Evaluation**

There has been no formal evaluation of the programme. Students sit for exams on the mainland.

**Future Planning/Vision**

Next year, the Zanzibar MoHSW CEU plans to take a larger role in coordinating the programme in Zanzibar in conjunction with AKU in Dar es Salaam. The aim is to improve the learning experience for Zanzibar students enrolled in the programme. The improvements are expected to enhance operational efficiencies and cost savings as tutors will not have to travel. The CEU is also hoping to establish an MoHSW high-capacity network, an online learning management system, and live collaboration applications that can be used for other distance learning purposes in the future. The improvements are expected to increase the capacity of the CEU to manage distance learning programmes.

The CEU will involve more partners, including DANIDA and the African eResource Centre Department, in coordinating the programme for Zanzibar students, and ZANA will continue to be involved. Tutors will no longer have to travel from Dar es Salaam to deliver face-to-face sessions, but will use the Elluminate virtual classroom to reach students in Morogoro and Zanzibar. Students will have access to computers through a lab at Mianzini Resource Centre in Zanzibar-town. The resource centre will also be used for developing information on HIV and AIDS and curricular materials for other HCW education programmes.

Ideas for the future suggested by tutors, students, and programme managers include the following:

- One ex-tutor suggested the programme should be expanded to Pemba.
- A Community Health Nurses programme offered on Zanzibar used a distance learning model and was very good. It was run by the African Medical and Research Foundation (AMREF) in Kenya for an 18-month period. The course was practical and focused on identifying needs in the community and acquiring diagnostic skills. One programme manager suggested that this programme could be revived and the curriculum adapted by AKU.
- Students need access to computers at no cost to them. One student suggested a loaner laptop pool.
- Copies of reference books need to be made and provided to students.
- Recruitment needs improvement. As noted, only four prospective students have applied for next year, even though the Zanzibar MoHSW reported that the programme will be free for all students.
• There is a need to improve student awareness of distance learning and how it is supposed to function as a learning modality. One student suggested improved orientation at the start of the course on how to excel in studying through distance learning.
• Face-to-face time between tutors and students should be increased to once a week.
• Students expressed an interest in going to Dar es Salaam more often (for example, on a field trip) so they can practice using clinical equipment. They would also like to use that experience to increase communication between the students based in Dar es Salaam and Zanzibar.
• Supervisors need to be better educated about what students are doing and how they can best support their employees participating in the programme.

AHADI INSTITUTE, KIGOMA

Date of Site Visit: June 27, 2008

Data Sources for Summary:

• Interview with one programme manager
• Review of website

Website: http://www.ahadi.be/

Description of Programme Activities

The AHADI Institute in Kigoma offers distance learning programmes for youth in the African Great Lakes Region. The Institute was officially established in Tanzania in 1997, targeting students in refugee camps in the area. It has developed partnerships with universities and other higher education institutions in the region and in Europe. AHADI offers opportunities for higher education to those who have been excluded through difficult circumstances. It does not offer its own degree programmes but uses materials provided by accredited educational institutions in Europe, and students receive degrees from those institutions when they finish their studies. AHADI serves as the coordinating centre for those degree programmes. The programmes offered include Law (degree level), Social Welfare (advanced diploma), Economics (degree level), and Teacher Training (degree level). The Institute does not offer training for HCWs at this time.

Target Population

The main target population was originally refugees from the Democratic Republic of Congo and Burundi. The focus was on youth whose studies were interrupted by war, but who remained committed to advancing their education. Because of the students’ refugee status, AHADI could not establish a permanent educational structure, so distance learning appeared to be the best approach.

To complement the distance learning component, tutors from the refugee community conduct face-to-face meetings. The courses and associated materials are prepared outside the country by the participating institutions. Occasionally, tutors from Europe travel to the refugee camps.
Successes and Advantages

- The AHADI Institute originally focused on refugees and was quite successful in reaching this target population. There were 798 students enrolled in 2002. With the decline in the refugee population, enrolment declined to 416 in 2007–2008.
- AHADI began with programmes in French, but has been offering programmes in English since 1999.
- Students meet in small study groups in the refugee camps.
- Academic partners from outside the country come to the camps to give a course introduction to new students, as well as to provide direction and motivation.

Challenges and Disadvantages

- Internet access is a problem for the students. Most students lack access to the internet, and even if they have access, the internet often is not functioning. There is no IT staff at the Institute.
- Internet skills are lacking among students. This is a hindrance, especially when students are trying to do research or writing their dissertations.
- It is difficult to find committed, capable tutors to follow up with students, especially outside of the refugee camps.
- The Institute’s premises are not well maintained—the building that houses AHADI is unfinished, and there are huge pits in the yard.
- AHADI faces many challenges in converting its programme from focusing on refugees to focusing on the general Tanzanian population.

Platforms/Media/Materials Used

Print-based materials are used at the AHADI Institute. As noted, the materials are prepared outside Tanzania by the institutions from which the courses originate. They are e-mailed to AHADI, which prints them out and distributes them to students. Because of limited funding, the Institute must charge students for the materials. E-mail is used to communicate with partners and students. CD-ROMS are also used where feasible.

Evaluation

AHADI evaluates students in accordance with its parent universities. The Institute cannot offer degrees directly since it is not accredited in Tanzania; only the parent universities can grant degrees and set the standards for the courses.

How Programmes Are Addressing HCW Shortages

As noted above, the AHADI Institute provides no HCW training. Its educational focus is solely at the baccalaureate level. However, the Institute does offer degrees in social welfare.

Future Planning/Vision

As stated, the AHADI institute has succeeded in its basic mission, but now that the refugee population is declining, it must change its focus. AHADI is trying to redirect its efforts toward the recruitment of Tanzanian students, but its vision of achieving accredited status in Tanzania may be thwarted by the condition of its premises and the challenge of attracting diverse and geographically scattered Tanzanian students. AHADI is also planning
to create a centre for ICT with the objective of strengthening its virtual library and use of the internet for learning. Outside of Tanzania, it is planning to expand its programmes in Burundi for returning refugees.

**HARVARD UNIVERSITY HIV ONLINE PROVIDER EDUCATION (HOPE) WEBCASTS**

**Date of Site Visit:** July 2, 2008

**Data Sources for Summary:**
- Interview with one programme manager
- Attendance at one live session
- Review of website

**Website:** [http://www.massgeneral.org/id/hivconsult/](http://www.massgeneral.org/id/hivconsult/)

**Description of Programme Activities**

The HOPE Conference Series is a series of bimonthly interactive conferences that utilise a web-based conferencing system called Centra 7. Through these live webcasts, health care workers at various Harvard University–funded project sites around the globe are able to participate in real-time discussions of issues relevant to the care of HIV-positive patients in resource-limited settings; other participants may take part as well. Each conference features a faculty presenter (usually based in the United States) with expertise in a specific area of HIV medicine. The session includes a didactic lecture followed by discussion and sometimes cases from participants. Participants/sites can submit cases for the presenter to discuss.

Tanzania started participating in HOPE in 2005. Participants are invited to join a session via e-mail. Prior to the session, sites are sent a link to log on to. Sites with enough bandwidth are able to transmit audio (ask questions by voice), while others must use the chat function to type questions or comments. The interface does not transmit video or an image of the presenter. Sessions are recorded and can be watched later as a downloaded file. At the Tanzania site, one person types into the computer; sometimes another person approaches and types in a question. The Tanzania site does not have enough bandwidth to transmit audio. Sessions last about 60–90 minutes. In Tanzania, a clinical director on site monitors the discussion after the live session and answers questions.

**Target Population**

Current participants in the sessions include health care workers from sites in Africa, India, China, the United Kingdom, the United States, and the Dominican Republic. Participants are clinicians from Harvard's clinic sites around the world. In Tanzania, participants are clinicians from 12 HIV care and treatment centres in Dar es Salaam; levels of participation vary among these sites. One programme manager interviewed in Tanzania stated that lately, attendance in Dar es Salaam has decreased. In the past, 20–25 participants came, but now they have too many patients, and clinicians are too busy to travel to the Harvard University headquarters in Upanga for the sessions. The sessions are held during clinic hours, creating a problem for attendance. Also, because there have been connectivity problems during the sessions, participants may feel as though their time has been wasted attending the session.
Successes and Advantages

- The webcast can reach a wide audience.
- The programme manager who was interviewed felt most sessions were interesting, and said that overall, participants like the sessions.
- Food and beverages are served to participants.
- IT staff is ready and available on site to assist with computer or internet problems.
- The Harvard University site has comfortable conference rooms for the live sessions.

Challenges and Disadvantages

- Programme staff noted that there is an internet problem during each session, resulting from a slow connection. These technological problems can severely impact the session (see comments on the observed session below). When the presenter switches to another slide, the participants continue to see the previous slide.
- Because participants are too busy to attend, and transport to the central site can be problematic, Harvard is considering expanding the programme to each clinical site.
- Two archived online sessions that were observed were highly focused on lecture, with little discussion or interaction from the sites.
- Additional challenges are discussed below in comments on the live observed session.

Platforms/Media/Materials Used

As noted, Centra 7, an online virtual classroom or meeting environment, is the webcasting platform. Participants view PowerPoint slides, a chat box, and other participants/sites that are logged in. Icons enable participants to raise their hand, laugh, applaud, answer quick yes/no questions, and so on. The presenter’s voice is transmitted live through a microphone. E-mail is used to distribute schedules and information about future presenters. Archived files of previous sessions are available on the HOPE website, but a password must be obtained from a programme coordinator.

Site Inspection Comments

There are two conference rooms—one small and one large—at the Dar es Salaam site where sessions are hosted. As noted, the rooms are comfortable, with large leather chairs and wooden tables. Another room contains about 20 computers with flat screens that are sometimes used for the sessions. A room outside the computer room contains a bar and a table for serving beverages and food during the sessions.

Live Observed Session Comments

On July 8, 2008, assessment team members took part in one session entitled ‘TB Infection Control’ with Dr. Edward Nardell. Eight participants made up the live audience in Dar es Salaam, and eight other sites were logged in worldwide (the total number of participants is unknown). The Tanzania site was experiencing difficulty with the connection and was trying to solve the problem with help from its IT staff; participants missed most of the session because of the technical difficulties. During the session, the internet connection was extremely slow. The organisers started trying to download at 2:15 PM (for the 3:00 PM session), but because the programme was not turned on at the U.S./originator site, they were unable to start downloading until a little before 3:00 PM. During the initial, very slow download process, the internet went down, and it was necessary to reload. The process took
about 45 minutes, so participants did not enter the online session until after all the slides had been shown, and discussion was in progress between the sites.

Each site had speakers and a microphone so participants could ask questions. However, transmission from some sites was garbled or low-volume. A Tanzanian participant tried to ask a question via the microphone, but it was not heard at the main site. Participants also had the option of asking questions using the chat function; the Tanzania site tried this method, but by that time the Harvard site was signing off. The U.S.-based moderator did not check in with the sites to address connection issues or to allow the Tanzanian participants to ask their questions using the chat mode before ending the session.

**Evaluation**

According to programme staff, an evaluation form is sent to site coordinators once a year at the end of the series. The form contains about ten questions. Sites do not keep a roster of participants or gather their feedback.

**Future Planning/Vision**

- Possible expansion to clinic sites so clinicians do not have to travel to the central site in Dar es Salaam to participate. This could improve attendance.
- Improvement of the internet connection by connecting directly to the server instead of using wireless so there will be fewer disruptions. However, this method was tried during the observed session and proved not to work.

**IFAKARA HEALTH INSTITUTE, IFAKARA**

**Date of Site Visit:** June 25, 2008

**Data Source for Summary:**

- Interview with one programme manager

**Website:** http://www.ihi.or.tz/

**Description of Programme Activities**

The Ifakara Health Institute offers AMO training, refresher courses for COs, laboratory diagnostic courses for areas with limited resources, and courses in life-saving skills for obstetric and neonatal emergencies. The AMO course is open to COs in Tanzania and elsewhere who have been in practice for at least 3 years in a health-related field. The Institute also coordinates and implements short courses for sponsors and other enablers (e.g., WHO) that want to provide health training for a targeted audience. There are currently 76 students enrolled in the AMO programme. The infrastructure at Ifakara provides good support for the programmes, and the internet functions well. The Institute has two full-time IT technicians, and students generally have good computer literacy and are given a basic computer skills course upon enrolment.

Ifakara Health Institute has been using personal digital assistants (PDAs) for several years to gather data for baseline household surveys, morbidity monitoring, a costing survey, and other purposes. For the household survey, the survey document is downloaded into a PDA, and Form IV graduates are trained in its use. The advantage of using a PDA is that it ensures
data quality and completeness as surveyors cannot skip questions. Also, data compilation is instant, and Global Positioning System (GPS) coordinates can be used as part of the survey. The greatest challenges noted were fear of technology and the need to sensitise/train users. Solar chargers and car chargers are used in areas without electricity.

**Future Planning/Vision**

Ifakara is considering using distance learning in the near future. It is planning to collaborate with the CDE on an e-learning project, likely focusing on upgrading COs to AMOs. The Institute also plans to create a distance learning programme for HCWs in emergency obstetrics.

**INTERNATIONAL INSTITUTE FOR COMMUNICATION AND DEVELOPMENT (IICD), TANZANIA**

**Date of Site Visit:** June 20, 2008

**Data Sources for Summary:**

- Interview with one programme manager
- Review of website

**Website:** [http://www.iicd.org/countries/countries/countries/tanzania](http://www.iicd.org/countries/countries/countries/tanzania)

**General:** [http://www.iicd.org/](http://www.iicd.org/)

**Description of Programme Activities**

IICD is a non-profit foundation established in Holland in 1996 to use IT to improve the lives of people in nine countries of Africa, the Caribbean, and South America. IICD uses both modern media (such as computers, the internet, and multimedia) and traditional media (radio, television) to help others benefit from ICT.

The Tanzania Country Programme started in mid-1998 with a national ICT Roundtable, but it was not until early 2000 that the programme was fully functional. Today, the Tanzania Country Programme has a variety of projects in four sectors: governance, education, livelihoods (agriculture), and health. Health-sector activities include the following:

- Implementation of a District Health Management Information System (HMIS) was started in 2006. The project is aimed at improving the collection, analysis, and utilisation of reliable health data in the region, with the ultimate goal of achieving increased accountability, improved tracking of health trends, and more effective interventions. The HMIS digitalises information on patient registrations, diagnoses, treatments, lab tests, billing, and pharmacy records. Thus far, it has been rolled out in eight hospitals, four offices of the city medical officer, and FBOs. The project includes ICT training and change management at the facility and district levels.
- An e-learning project based at Muhimbili University College of Health and Sciences (MUHAS) includes the conversion of conventional in-service and pre-service courses, as well as workshop materials, into e-learning format. The courses will be able to be delivered online or via a CD or memory sticks. The project is currently working with five ZHRCs (Eastern, Northern, Southern, Southern Highlands, and Lake). One focal
person has been trained at each of these ZHRCs. The project works with the Accreditation Department of the Ministry of Education for purposes of certification.

**Successes and Advantages**

- The programme uses open-source software when possible, so the technology is free for anyone to use.
- IICD has established standards for the development of learning materials. According to the programme manager interviewed, these standards result in a higher-quality product.
- Content developers for the learning materials are well trained.
- The e-learning project complements rather than substituting for traditional classroom-based learning. It promotes a blend of methods and emphasises the importance of the face-to-face component of learning/teaching.
- IICD’s projects are innovative and creative in accessing technology. For example, they are taking advantage of an unused fibre optic cable to achieve greater internet bandwidth.
- IICD has an inventory of all ICT projects in Tanzania.
- The organisation holds open meetings with students and young people to gather information and brainstorm concepts for ICT.
- Access to Global Campus 21 online e-learning courses is free for those working with IICD in Tanzania.
- HMISs have been developed and implemented in Tanzania. A need for a data tracking system has been identified, and IICD has started to fill this gap with its projects.
- Many experts are available to assist in developing technological solutions.
- IICD involves many local development partners in its projects, including various ICT projects in governance and education, economic development, policy development, and capacity building.
- IICD hosts telemedicine conferences and provides other venues for organisations to collaborate and brainstorm on ICT best practices, lessons learned, and future priorities.

**Challenges and Disadvantages**

- IICD has encountered challenges in dealing with bureaucratic hurdles as a non-profit, and as a result is trying to become an independent company so it can make decisions more easily and quickly. IICD was working with the MoHSW, but the MoHSW’s decision-making process is time-consuming. IICD hopes that establishing a company to work with the MoHSW will reduce this time lag.
- Serious interruptions in the electricity supply remain a major problem in Tanzania, and have halted progress on the installation of HMISs in the Mwanza area. This situation not only jeopardises the strong motivation behind that project, but also weakens the involvement of the decision makers, including councillors.

**Platforms/Media/Materials Used**

As noted, IICD uses both modern media (computers, the internet, multimedia) and traditional media (radio, television) in promoting ICT. Its HMIS system uses computers and software developed for health data management. Its e-learning materials are on CD and/or memory sticks. A combination of face-to-face learning and self-study is emphasised.
Evaluation

IICD has had a monitoring and evaluation system in place for some years that is used to compare the results of projects and training over time. The data show a general improvement in gender balance and increased satisfaction among end users for all projects. The IICD website highlights the following results:

For most projects, more than 80% of respondents claim to have reached their personal goals, comments include:

‘Instead of travelling all the way to Mwanza, I managed to communicate with people on the internet’ (end user of a livelihoods project).

‘I can now prepare teaching materials and keep my student records using the computer’ (end user of an education project).

Future Planning/Vision

- IICD is currently investigating opportunities related to collaboration between strong development partners and local partners in the scaling up of existing projects to the national level.
- IICD is exploring the use of mobile phone learning whereby information is recorded by phone, and students then answer questions with their keypads.
- IICD is starting a company to train people to develop e-learning materials. Trainees will develop a product with help and input from IICD, which will build their capacity. IICD will then act as a resource pool or connection for identifying where that product might be utilised and sell it. Developers will receive 55 per cent of the profits and IICD 25 per cent (it is not clear what happens to the remaining percentage).
- IICD will be opening an e-learning centre in Dar es Salaam in September 2009.

InWEnt, GLOBAL CAMPUS 21, DAR ES SALAAM

Date of Site Visit: June 6, 2008

Data Sources for Summary:

- Interview with one programme manager
- Review of website

Websites: InWEnt: http://www.inwent.org
          Global Campus 21: http://gc21.inwent.org
Description of Programme Activities

InWEnt is a German-based NGO whose goal is capacity building through human resource development and training. InWEnt provides e-learning courses in the areas of health, education, business, and humanitarian studies through Global Campus 21. Several courses are offered using this platform. They include short courses, such as HIV/AIDS Benchmarks for Health Professionals in Africa, and long courses, such as the collaborative Northern ZHRC/CEDHA District Health Management course described in Section B.1. InWEnt also offers a year-long course in International Leadership Training for Hospital Management, which has participants from five African countries, including Tanzania.

Several Global Campus 21 short certificate courses, each lasting 3 months, are coordinated at InWEnt’s Tanzania office. Participants are selected from five target countries: Kenya, Cameroon, Tanzania, Malawi, and Rwanda. Prior to 2008, Kenya was the main venue for face-to-face meetings for these courses, but given the post-election violence in that country, Tanzania has now been selected to host some of the face-to-face meetings.

The InWEnt programme is coordinated centrally in Germany. Participants meet in one of the African countries for 1–2 weeks for a course introduction and some group work, sharing experiences from their respective countries. At this initial meeting, timetables and modules are distributed, as well as assignments. When participants return to their home countries, they participate in online sessions in real time. These sessions are broadcast from Germany and taught by German tutors. The sessions can be held up to four times a week and last up to 3 hours each, varying by course. Students can submit assignments via e-mail links. At a final face-to-face meeting held at the end of the course, students receive a certificate. Students can attend this meeting only if they have completed and passed all assignments. The only cost to participants is for internet use; InWEnt pays for all materials, travel, and accommodations.

Target Population

The Tanzania office recruits participants from various local partners, including the MoHSW, the Ministry of Education (MOE), the National Institute for Medical Research (NIMR), MUHAS, and others, and forwards the applications to Bonn. Usually there is a limit of 20–45 participants per course. One criterion for acceptance is that the participant must have regular access to the internet, as well as knowledge of how to use a computer. Another is a good command of English, the language used for all sessions and materials. Each course has its own selection criteria for the profession(s) of participants, based on the topic covered.

Platforms/Media/Materials Used

Several tools available on the Global Campus 21 learning platform enable interaction, communication, and cooperation. All of the e-learning materials can be downloaded from the internet once a participant has been accepted into the programme and obtains an access code. Methodologies used in the course include discussion, group and individual assignments, quizzes, and case studies. Students receive reminder messages about assignments and live sessions from the tutors in Germany via e-mail.

During the online sessions, students who have webcams on their computers can see each other and their tutors. Alternatively, they can use live chat or a microphone to ask tutors questions or have a group exchange. An electronic bulletin board is available for posting information of general interest, as well as a document pool for exchanging completed assignments.
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

Date of Site Visit: June 20, 2008

Data Sources for Summary:

- Interview with one programme manager
- Review of website

Websites:

- General: http://www.muhas.ac.tz/
- List of programmes: http://www.muhas.ac.tz/index.php?option=com_content&task=view&id=46&Itemid=64

Description of Programme Activities

MUHAS is a successor to MUCHS, and is the only public university for health sciences in Tanzania. It has undergraduate programmes in laboratory sciences, radiological therapy technology, pharmacology, dentistry, medicine, and nursing, along with nine new postgraduate programmes conducted in five schools and one institute of the university. There are also diploma and advanced diploma courses. A full list of programmes offered is posted at the website given above.

Electronic Resources

MUHAS has a 24-hour reading room that is supported by fully equipped ICT facilities, including computer labs and other e-learning resources. According to a programme manager, the university is in the process of developing some distance learning courses that will be available to students. Knowledge management is a specialty of MUHAS. Through its Directorate of ICT, in collaboration with Tufts University in the United States, MUHAS has installed a web-based platform called Tufts University Sciences Knowledgebase (TUSK), a multimedia knowledge management system that supports faculty and students in teaching and learning. TUSK provides a portal to an integrated body of knowledge through journals, websites, and other electronic resources. The e-learning system design for co-curricular development is accessible to both staff and students at <http://ccd.muhas.ac.tz>.

Internet Access and Resources

The university has invested in a powerful fibre optic network connecting all buildings on campus and enabling high-speed data transmission. Internet access is provided through a VSAT link currently operating at a bandwidth of 512/256 kilobits per second (down/up) and being upgraded to 2/1 megabits per second (down/up). The server room is equipped with eight servers and eight routers. The servers provide the MUHAS website, e-mail access, internet surfing, online learning, and digital library services. The routers distribute information traffic to different buildings and reduce data jams. These expensive instruments are protected by two uninterruptible power supply units and a solar power back-up system. Computer rooms in the library provide students with computer access. In addition, there is a computer room for undergraduate students at the Kagera student hostel. All of these rooms are linked by wireless internet connections that make them hotspots, allowing users to access the internet without physically entering the buildings. Nine lecture halls at MUHAS are fitted
with multimedia projectors and desktop computers to provide lecturers with reliable teaching aids. Equipping of similar facilities in other teaching rooms is ongoing.

**Television and Videoconferencing**

The operating theatre at Muhimbili National Hospital is fitted with a closed-circuit television that enables students to view operations in the theatres without having to be physically present. This capability alleviates the congestion resulting from increased student enrolment. The university recently acquired a closed-circuit video facility that will facilitate teaching and learning. It also acquired a videoconferencing facility that will support communication regionally and internationally.

**Muhimbili Health Exchange Forum (MuHEF)**

This internet portal and online forum facilitates communication and the flow of health information to and from the districts, regions, health experts, and postgraduate students. The aim is to make it easier for HCWs to update their health knowledge and to inform them of relevant resources. The website (www.muhef.or.tz) contains recent health publications and guidelines from WHO and the MoHSW that focus on policy, training, and treatment of various conditions. A section on HIV and AIDS addresses prevention, transmission, and ways of overcoming stigma and living positively. Additionally, a question and answer section allows HCWs working in regional areas of Tanzania to communicate with experts working in Muhimbili National Hospital, Muhimbili Orthopaedic Institute, and MUHAS; responses to questions are received from selected experts within 3 days. Before MuHEF was developed, a study was conducted in early 2003 among HCWs from all the regions to determine the information needs of those working in peripheral areas.

An offline CD-ROM version of MuHEF is available for use in places that lack internet access. The CD-ROMs are distributed annually, during promotional activities for the website at meetings, or at national and international conferences.

**Successes and Advantages**

- The MuHEF website has received more than 28,000 visits since its inception in late 2003, and the number of visits has been increasing during this period.
- Health services and the knowledge of HCWs in the districts have improved through the website’s question and answer feature.
- The features of the website have improved over the years as it has been promoted internationally and nationally, such as during the annual scientific conference in Arusha, Tanzania, and at a teleconference held in Luxemburg, Germany.
- HCWs in the districts have increased knowledge of and access to national guidelines, policies, and strategies, as well as a greater ability to use ICT and the internet to search for health information.
OPEN UNIVERSITY OF TANZANIA (OUT), DAR ES SALAAM

Date of Site Visit: June 19, 2008

Data Sources for Summary:

- Interviews with two programme managers
- Review of website

Website: www.out.ac.tz

Description of Programme Activities

OUT is a fully accredited public institution of higher learning. It was established by an Act of Parliament in 1992 and is mandated to conduct distance learning programmes leading to certificates, diplomas, and undergraduate and postgraduate qualifications.

OUT conducts its operations through 25 regional centres and 69 study centres. According to one programme manager, each regional centre has at least five tutors for each major content area. There are study centres at each regional centre. Within each region, several institutions with adequate facilities have been identified to serve as study centres, including secondary schools, colleges, and institutes. At the study centres, students can use reference materials, do project work, interact with other students, attend seminars and tutorials, do practicum work, and attend demonstrations. The study centres also provide counselling and tutoring services for OUT students, as well as physical facilities such as classrooms, libraries, and laboratories. Students from outside Dar es Salaam are affiliated with one of the regional centres.

OUT offers degree programmes in science, education, business management, law, and other areas in addition to its certificate programmes. Currently about 38,000 students are enrolled. All students must complete their studies within 8 years. The university employs about 400 tutors, 180–200 of whom are full-time. Tutors are given training in distance learning techniques.

Each course includes two 3-day face-to-face sessions, with practica as necessary depending on the course. A web-based platform enables the posting of both instruction and student responses. An on-site lab prepares DVDs for distribution, while an audiovisual lab provides audiotapes for handicapped students. At present, Voice over Internet Protocol is being established in ten regions to permit synchronous real-time educational interactions.

Target Population

OUT was launched to meet the needs of students who could not get into a full-time university programme and those wishing to work and study simultaneously. Like the HTIs, universities have limitations on space available for traditional, classroom-based learning.

The various programmes have different requirements. For a Certificate in Distance Education, the minimum entry requirements are 1) a Form IV Certificate with at least five passes or its equivalent, plus 2) a professional certificate obtained from a nationally recognised training institution or a diploma, an advanced diploma, a first degree, or a postgraduate degree.
Successes and Advantages

- OUT can reach many people, providing education in an affordable and convenient manner.
- OUT’s many years of distance learning experience could serve as a model and provide valuable lessons learned for new programmes. Its approach of decentralisation to regional centres is an example of a best practice.
- Face-to-face instruction occurs at regional centres, not at the central campus, making it possible to reach students in regions across the country.
- All tutors receive training in distance learning techniques.
- Assignments are marked at the regional centres, facilitating feedback to students.
- Last year OUT graduated its first physically challenged student. This student would not have been able to attend a traditional, classroom-based programme because of his physical condition.

Challenges and Disadvantages

- Convenience for students can sometimes be an inconvenience for tutors because the distance learning courses extend beyond the academic calendar year.
- There is a lack of planning and coordination with students.
- The dropout rate is high. One programme manager indicated it is as high as 60 per cent.
- Challenges are associated with coordinating responsibilities related to the courses, such as recruiting participants, preparing and distributing materials, and collecting materials and evaluations.
- The cost of bandwidth in Tanzania is a limiting factor in increasing use of the internet and e-learning applications.

Initially, OUT used print-based materials, transmitting the materials and receiving student responses by post. This method is still used for remote regions, but OUT is moving toward an ICT-based approach. E-mail is used to send out materials, to receive responses from students, and to enable students and tutors to interact. Some materials are available over the internet and some on flash drives or CDs. Web-based programmes now exist in ten regions, and students can post assignments in a student register on the OUT website. OUT uses a free e-learning platform called Moodle, which is designed to help educators create online courses with opportunities for rich interaction. Its open-source license and modular design allow users to develop additional functionality.

Evaluation

OUT uses three types of assessments to measure students’ progress: a dialog assignment, a timed test, and a final exam worth 60 per cent of the student’s grade. The dialog assignment can be completed at home, but each student must go to his/her regional centre for the timed test and final exam. Student evaluations of tutors are also solicited, as is feedback on course improvements. Each university in Tanzania undergoes evaluation by the Tanzania Commission for Universities. Accreditation starts with self-evaluation and infrastructure assessment at OUT regional centres, student/staff ratios, and communications with students.
How Programmes Are Addressing HCW Shortages

OUT does not provide training for HCWs, although it has considered a nurse training programme. The university would like to expand to include programmes for HCWs, but it would need a practicing hospital to educate students.

Future Planning/Vision

OUT wishes to be a leading, world-class university in the delivery of affordable quality education through distance learning. The university is continuing to improve existing and develop new programmes. It believes that bandwidth increases will make it possible to use technically innovative approaches to bring affordable and timely education to students.

PHONES FOR HEALTH

Date of Site Visit: July 1, 2008

Data Sources for Summary:

- Interview with one programme manager
- Review of website

Website: President’s Emergency Plan for AIDS Relief (PEPFAR) website with programme description: http://www.pepfar.gov/press/80384.htm

Description of Programme Activities

Phones for Health is a USD 10 million public–private partnership in which mobile phone operators, handset manufacturers, and technology companies work in close collaboration with ministries of health, global health organisations, and other partners to use the increasingly widespread mobile phone coverage in the developing world to strengthen health systems. The core private-sector partners are the GSM Association (representing more than 700 mobile operators with more than 3 billion subscribers in 200 countries), Motorola, Voxiva, Accenture Development Partnerships, and Mobile Telephone Networks (MTN) (the leading mobile operator in Africa). Phones for Health is also supported by the President’s Emergency Plan for AIDS Relief (PEPFAR) and governments in the participating countries. There are two primary goals: to develop an integrated set of standard information solutions that support the scale-up of national programmes addressing HIV and AIDS, TB, and malaria; and to deliver those solutions in a way that is cost-effective, scalable, sustainable, and replicable. In Tanzania, Phones for Health has three programmes:

- With the MoHSW Blood Transfusion Service, development of a blood donor message system for high school students in Dar es Salaam.
- With the National AIDS Control Programme, an effort to simplify anti-retroviral therapy (ART) reporting by using mobile phones to send care and treatment data from individual health facilities to the district, regional, and national levels. This programme is being piloted in Mwanza, Singida, and Tabora regions.
- Development of an integrated disease surveillance and response system in the Mwanza region.
HCWs in the field use a standard Motorola handset equipped with a downloadable application to enter health data. Once entered, the data are transferred via a packet-based mobile connection (general packet radio services [GPRS]) into a central database. If GPRS is not available, the software can use an SMS data channel to transmit the data. The data are then mapped and analyzed by the system, and are immediately available to health authorities at multiple levels via the web. The system also supports SMS alerting and other tools for communication with field staff.

In many African countries, fixed-line internet connections are rare, and print-based forms remain the primary way of recording the spread of disease. But more than 60 per cent of the population now lives in areas with mobile phone coverage, and the GSM Association expects that figure to rise to 85 per cent by 2010. This makes it feasible to use mobile phones to relay the data directly to health authorities’ computer systems, allowing rapid interventions such as distribution of medication and education programmes for those at risk.

Upon interviewing the programme manager, it became evident that, while the system was developed to follow case workers in the field and to manage epidemiological data concerning new HIV and AIDS cases, it could also have applicability for distance learning. Some potential uses are to track students, to obtain feedback from tutors in the field, to collect information from students after they have been trained, and to continue communications with the chosen target group (either students or HCWs).

Target Population

The system is targeted at organisations and institutions that send HCWs into the field to collect data. HCWs transmit the data through their specialised mobile phones to a centralised hub and download data as well. Alerts or SMS can be sent to them in the field.

Platforms/Media/Materials Used

Phones for Health uses three methods for transferring data from the field: interactive voice response; a web-based programme; and J2ME, a Java-based programme.

Successes and Advantages

- The Phones for Health alliance builds on the partners’ successful experience in Rwanda in deploying a system built by Voxiva called TRACnet, working in close cooperation with the Government of Rwanda and PEPFAR. The system has been used for the last 2 years to manage the country’s national HIV and AIDS programme.
- The programme originally focused on ten African countries. The partnership is likely to be expanded in Africa and Asia to address TB, malaria, and other infectious diseases.

Challenges and Disadvantages

- Training of users was identified as a challenge, and more workshops for this purpose are needed. Data quality is also a challenge.
- Phones for Health is trying to avoid the creation of parallel systems. It believes its programme could serve as a new platform for Human Resource Information Systems (HRIS) and integrated disease surveillance and response.
- Some cell phone networks are unstable, and some areas do not have service. Some districts lack internet connectivity.
How the Programme Is Addressing HCW Shortages

The programme will provide technical support for HCWs in the field and a centralised means of record keeping at the national level that will allow programme managers to track epidemiological developments.

Future Planning/Vision

Other applications being explored in Tanzania are drug distribution, adherence support, and patient education. According to Paul Meyer, Chairman of Voxiva, the company that designed the software, ‘Health workers will also be able to use the system to order medicine, send alerts, download treatment guidelines, training materials and access other appropriate information. Managers at the regional and national level can access information in real-time via a web based database’ (Voxiva. 2007).

TANZANIA EDUCATION AND RESEARCH NETWORK (TERNET)

Date Information Was Collected: November 2008

Data Source for Summary:
- Review of website

Website: http://www.ternet.or.tz/

Description of Programme Activities

TERNET is a network of Tanzanian higher-learning and research institutions that aims to facilitate and enable the collective use of ICT resources to enhance the efficiency and quality of research and education in Tanzania, including distance learning. The network was initiated in March 2007. Its main goal is to establish the National Research and Education Networks (NREN), a high-speed internet network used specifically for linking research and education communities in a country. The network’s full set of goals encompasses facilitating e-learning initiatives in Tanzania.

TERNET is attempting to provide a network infrastructure that will facilitate education management information systems (EMISs); support e-libraries, electronic information access, and research databases; and enhance e-learning capacity. Among other objectives, this infrastructure will connect educational institutions in Tanzania, introduce ICT and its use in education to tutors and students, and reduce the digital divide between urban and rural training institutions. TERNET was registered as a trust in April 2008, and most of its programmes are currently in the planning stage. Its existing and potential efforts include those described below.

Education Management Information System (EMIS)

TERNET plans to make use of open-source software–based systems to facilitate an EMIS. Currently, there are several efforts under way in Tanzania to create information management systems at both the institutional and national levels, and most educational institutions use their own information management system. There is no central coordination for the development of these systems, which means that they are not compatible. Demand is increasing for an EMIS that can accommodate the requirements of different universities.
Support for Libraries and Electronic Information Access

TERNET plans to work closely with the Consortium of Tanzania University and Research Libraries (COTUL) to build capacity for sharing e-resources and e-library management, control, and maintenance. This body is strategically important for the development of information resources in Tanzania and for collaboration in the research and development of educational content.

Enhancement of e-Learning Capacity

The goal of this programme is to oversee the capacity building and enhancement of e-learning among the TERNET member institutions. TERNET intends to facilitate existing efforts and initiate joint programmes to make e-learning resources available for teachers and students in higher education institutions (HEIs). Several members of TERNET have initiated efforts to enhance their e-learning capacity, but these efforts are still in the early stages.

TERNET hopes to ensure that HEIs acquire networked computers, multimedia devices, and tools to enhance the efficiency and quality of classroom teaching and learning and online and distance learning. It also hopes to give students and teachers access to network-based electronic resources. This programme will include ongoing capacity-building activities within TERNET to help the organisation develop the expertise necessary to provide guidance to HEIs on ICT and best practices in content creation to enhance the teaching and learning environment. TERNET also intends to establish and administer a process for HEIs to mobilise funds for acquiring and utilising computer and multimedia resources in accordance with TERNET guidelines. The process will include criteria for ensuring the successful implementation of such computer and multimedia resources to enhance the efficiency and quality of classroom teaching and learning and online and distance learning.

TERNET connects 54 HEIs in 10 of the 26 regions in Tanzania, including 19 HEIs in Dar es Salaam; 4 in Zanzibar; and the remainder in Dodoma, Morogoro, Iringa, Mbeya, Tanga, Moshi, Arusha, and Mwanza. More than 90 per cent of the TERNET member institutions are located in areas where Tanzania Electrical Supply Company (TANESCO) infrastructure for fibre optic cable has been or is planned to be installed. TERNET is expected to be among the first developmental projects to use the planned national fibre optic backbone.

Target Population

As noted, TERNET seeks to support universities and other HEIs by providing a network infrastructure that facilitates EMIS; supports e-libraries, electronic information access, and research databases; and enhances e-learning capacity. These capabilities will benefit both faculty and students at these institutions, as well as the institutions themselves.

Successes and Advantages

- TERNET is using thoughtful and realistic strategies to facilitate EMIS; support e-libraries, electronic information access, and research databases; and enhance e-learning capacity. HEIs will be among the beneficiaries of these capabilities once they are implemented.
- The planned national fibre optic communication infrastructure is promising and will allow TERNET to implement its programmes throughout the country.
Challenges and Disadvantages

- Funding is a challenge. TERNET’s activities are supported by the voluntary contributions of a few member institutions.
- Sustainability is also a challenge. Without a reliable funding source, TERNET is considering membership fees and income-generating secretariat activities.
- Since HEIs are dispersed throughout Tanzania, it is a challenge to identify the best centralised point for deploying the network infrastructure. TERNET plans to initiate deployment in regions with the largest number of HEIs and those where fibre optic infrastructure exists.
- TERNET staff work part-time on a volunteer basis.
- An extensive national fibre optic communication infrastructure that TERNET can use to implement its programmes does not yet exist.

How Programmes Are Addressing HCW Shortages

Enhancement of e-learning capacity, electronic information access, and EMIS will increase the efficiency of all HEIs, including health education institutions. It will facilitate the implementation of distance learning programmes, making it possible to offer training to more students.

Future Planning/Vision

TERNET plans to draw on its network, which includes 54 HEIs, OUT’s various regional centres, and research centres across the country. Specifically, it wants to take full advantage of the bandwidth capacity that will be generated by the network to introduce its innovative applications and programmes in the areas of e-learning, electronic information access, and EMIS. TERNET plans to address the need for a secure, reliable broadband network to allow access to high-quality data and services across educational and research institutions, including HEIs.

TERNET hopes that a national fibre optic communication infrastructure that can be used to implement its programmes will be completed in the near future. The Tanzania Ministry of Infrastructure Development has proposed a national ICT infrastructure that would make use of the excess capacity of the existing links owned by various public institutions. This infrastructure would terminate at each district on the Tanzania mainland and cost USD 170 million. Implementation could take up to 18 months, but this proposal has not been finalised. TERNET has also discussed making use of the existing TANESCO infrastructure. A recent analysis indicated that 90 per cent of TERNET members are located close to existing or planned TANESCO infrastructure.
TANZANIA GLOBAL DEVELOPMENT LEARNING CENTRE (TGDLC)

Date Information Was Collected: November 2008. (Numerous attempts were made to conduct site visits in June, July, and August, but programme staff were not available for interview.)

Data Source for Summary:

- Review of website

Website: http://www.tgdlc.go.tz/

Description of Programme Activities

The TGDLC is a non-profit organisation that offers high-end videoconferencing using a wideband satellite system linked to more than 120 global conferencing centres. It also has e-learning courses available, as well as a computer lab with Internet capabilities and CD-ROM, print, and video services. Its videoconference room can be rented out by organisations in the public or private sector for a connection charge of USD 205 plus USD 200 per hour. Most recently, the Tanzania Heart Institute used the system to conduct a telemedicine session involving a live heart operation with the African Heart Institute.

Target Population

The target audience for the TGDLC is public servants and members of the private sector and civil society.

Successes and Advantages

- As noted, the TGDLC’s wideband satellite system is linked to more than 120 global conferencing centres, which allows for high-quality international videoconferencing.
- A wide range of courses is offered through a several modalities: computer-based/online, videoconferencing, global dialogue, and face-to-face.
- Partnerships that include The World Bank, the Global Development Learning Network, the British Council-Tanzania, and the Tanzania Development Gateway offer potential opportunities to collaborate with domestic and international organisations.

Challenges and Disadvantages

- The cost of the TGDLC’s videoconference service (with online access) likely prevents many organisations and individuals from using the services.

Future Planning/Vision

The TGDLC would like to become a leading, world-class knowledge transfer centre for the development community.
WORLD HEALTH ORGANISATION: INTEGRATED MANAGEMENT OF
CHILDHOOD ILLNESS COMPUTERISED ADAPTATION AND TRAINING TOOL
(ICATT): DAR ES SALAAM

Date of Site Visit: June 20, 2008

Data Source for Summary:

- Interview with one programme manager

Websites: General site: http://www.icatt-training.org/
Information on the Tanzania project:

Description of Programme Activities

ICATT is an e-learning software application that was developed as an alternative training approach to support the implementation of the WHO/UNICEF strategy on the Integrated Management of Childhood Illness (IMCI). The computer-based IMCI course was created with assistance from Novartis (a pharmaceutical corporation in Switzerland) and took 2 years to complete. It permits country-specific adaptations of general guidelines for IMCI at the national and sub-national levels.

WHO is currently adapting ICATT to the Tanzanian context; at the time of the site visit, the programme had not yet been implemented. Some modules will be translated into Kiswahili, particularly for community-based HCWs. Once the adaptation has been completed, the programme will be transferred to the MoHSW, which will then own it. WHO is collaborating with the MoHSW, as well as with other partners, including Ifakara Health Institute (which will conduct the AMO pilot), Muhumbili University (which will conduct the medical officer pilot), and Kilosa COTC (which will carry out the CO pilot at the COTC). WHO predicts that by September or October 2008, it may be possible to pilot the ICATT course in Ifakara with in-service AMOs. By November or December, WHO hopes to pilot the programme in Iringa as well, using a Kiswahili version for in-service HCWs. First, however, it plans to obtain feedback from various stakeholders and develop a final evaluation plan for the programme’s roll-out.

For the computer-based training, tutors will be more like resource persons. They will receive training from TOT tutors who will already have been trained in IMCI.

Target Population

ICATT-based IMCI courses are being planned for both in-service and pre-service training. Some of the cadres being targeted are in-service COs and AMOs and community-based HCWs. The programme can also be used for refresher courses for cadres trained in traditional IMCI courses.

Successes and Advantages

- The ICATT training tool makes it possible to adapt generic IMCI guidelines at the national and sub-national levels, and to develop courses that are suited to various training approaches.
– The chart booklet builder tool permits easy revision of the chart booklet, which provides clinical guidance, according to national or sub-national guidelines.
– A tailored course, based on the generic course and the resource library, can be created with the tool.

• The course will help the MoHSW implement IMCI and reach a greater number of HCWs (5 per cent of district budget is to be reserved for IMCI training).
• The standard IMCI training lasts 11 days and can be a burden, as it removes much-needed HCWs from their facilities for a long period. The computer-based training can be completed in 7 days.
• Previous randomised controlled studies in Uganda comparing participants in a computer-based version of IMCI with those in a classroom-based course found that increases in knowledge and skill were the same, and among women, the results for the computer-based course were slightly better (QAP, 2006). Programme staff at WHO Tanzania expect similar results.
• Updating IMCI materials is expensive and time-consuming, and the materials become outdated quickly. Since ICATT materials are online, updates and modifications can be made rapidly at minimal cost.
• The software provides a wealth of reference materials in its virtual library.
• ICATT can support the need for IMCI refresher training for HCWs in Tanzania.
• No special skills are required to manipulate the open version of the software (e.g., for updating or making adjustments to the programme), rendering it very user-friendly.
• The programme allows the training to be used for pre-service, in-service, and community-based HCWs. It could also potentially be used in classroom settings, broadcast over the internet in a virtual classroom, or used for self-study.
• The programme can be translated into different languages. In the case of Tanzania, it is being translated into Kiswahili for the training for community-based HCWs; English will be used for other cadres.

Challenges and Disadvantages

• Challenges include the difficulty of finding people to help with the Tanzania-specific adaptations who are trained in both software development and curriculum design, in addition to having content expertise. These experts are needed to finalise the Tanzania adaptation, as well as to maintain the programme.
• Many of the sites where WHO plans to hold ICATT training lack computers. Moreover, finding trainers with the appropriate skills to facilitate the ICATT course has proven challenging.
• WHO is considering how best to train people for these courses who may have never used a computer.

Platforms/Media/Materials Used

ICATT’s training set includes generic materials, such as modules and training units, as well as exercises designed to be used for teaching purposes by individuals or for group learning. Also provided are tutor guides to help in conducting various training activities, such as classroom-based instruction and clinical practice.

As noted, the software contains a chart booklet builder tool that allows revision of the chart booklet according to national guidelines. There is also a virtual library containing key technical resources, such as video and audio materials, for use in training. The library permits tools and resources to be added or modified by the developer.
Evaluation

Currently no evaluation plans exist. As noted above, however, WHO Tanzania would like to perform an evaluation comparing the traditional IMCI training with the computer-based ICATT training in terms of knowledge and clinical skills gained, as was done in Uganda.

How Programmes Are Addressing HCW Shortages

The ICATT training decreases the amount of time HCWs must be away from their facilities and reduces the cost of their training, potentially allowing institutions to provide more training for these workers.
B.3 Conferences Attended in Tanzania

This section summarises two conferences attended in Tanzania:

- Second National Telemedicine Conference, Dar es Salaam (page 232)
- mHealth Workshop: Mobile Phone Applications for Public Health, Dar es Salaam (page 234)
SECOND NATIONAL TELEMEDICINE CONFERENCE, DAR ES SALAAM

Date of Conference: July 1, 2008

Data Sources for Summary:

- Attendance at the conference by two assessment team members
- A final report by conference organisers e-mailed to participants following the conference
- An article reporting on the conference by IICD, titled ‘A change in thinking: how do you make telemedicine work?’ <http://www.iicd.org/articles/telemedicine-ipath-tanzania>

Description of the Conference

Telemedicine practitioners and other stakeholders from throughout Tanzania gathered for their second telemedicine platform meeting in Dar es Salaam on July 1, 2008. The use of telemedicine in Tanzania is relatively new. Only in the past few years have telemedicine programmes really taken off. The conference was convened to capture lessons learned from others’ experiences, discuss how to overcome challenges and barriers, identify practicing organisations and institutions, and provide input for the development of a national policy. The conference was organised by Christian Social Services Commission (CSSC) in collaboration with AfyaMtandao and IICD. The conference was participatory and also involved brief presentations.

Target Population

Practitioners, organisations, and institutions practicing telemedicine, as well as policy makers, were invited to participate; there were 18 participants. Participating organisations included Evangelical Lutheran Church (ELCT), MUHAS, I-TECH, IICD, AfyaMtandao, CSSC, Aga Khan Hospital, Mkapa Foundation, Tanzania Christian Medical Association, and Mission for Essential Medical Supplies.

Successes and Advantages

ELCT, an FBO that operates in the Northern Zone, shared its experiences with telemedicine. Its programme began training doctors from 14 hospitals in the use of iPath, an open-source online medical consultation tool developed by the University of Basel. iPath is used by an international online community of doctors who upload medical cases in the hope of receiving a consultation by return. There are more than 300 iPath participants in Tanzania. Usually received within 24 hours, consultations can come from Tanzanian doctors, but also from foreign doctors who are part of the community. Aside from learning to use iPath, doctors were trained in using digital cameras so they can include pictures when submitting a case to the iPath community.

Since the start of the project, ELCT doctors have uploaded 43 cases to iPath, receiving 66 return consultations (only 1 in HIV) within the first 3 months. Most cases were in the fields of dermatology, radiology, internal medicine, and paediatrics. ELCT believes the consultations have helped clinicians treat their patients better, saving time and cost. On the other hand, of the 14 hospitals in which doctors were trained, only 5 are using the tool, and those involved are mainly young doctors (rather than older ones, who are less computer
literate); doctors in remote hospitals, who cannot send patients to referral hospitals; and doctors in hospitals run by foreign missionaries, who tend to promote the use of telemedicine.

Another example of telemedicine use was shared by Peramiho Hospital, located in the southwest of Tanzania. For the past year, the hospital has been using iPath specifically for telepathology because it lacks a local pathologist. By connecting a digital camera to a microscope, doctors are able to send the images for diagnosis to pathologists based in Germany, who can screen them for cancer. Thus far, more than 600 images of specimens have been taken and sent for consultation.

Challenges and Disadvantages

The discussions that took place during the 1-day conference highlighted a number of challenges to the uptake and diffusion of telemedicine. Apart from technical issues, such as a lack of sufficient bandwidth to upload high-resolution pictures, most of these challenges are human related. One important factor is a lack of computer knowledge. ‘Computers in hospitals are mostly used as typewriters…older doctors [especially] need to get familiar with them,’ said one participant. Another said there is a belief that ‘computers are for secretaries’. Some doctors also feel that the tool is being imposed or forced on them.

Participants also noted that a prevailing attitude toward knowledge sharing can be a barrier: doctors are not used to seeking a second opinion. One participating doctor, who is not yet using the tool, explained why she hesitates to use the new technology: ‘For me this would be an extra work load. I need a person to help me with this. Can someone be hired in each hospital to assist with telemedicine?’ A telemedicine project manager replied that an extra staff person for telemedicine is unfortunately not the solution. ‘It is a matter of perception; doctors need to change their attitudes. This is the easiest way to help doctors and to save patients.’

One expectation when a new technology is rolled out is that the knowledge acquired from training sessions will trickle down to other colleagues in the hospital. However, doctors generally are too busy to train their colleagues. A solution offered was to organise on-site training in each hospital so a larger group can be exposed, and doctors will not need to leave their hospital. One manager has learned from these challenges: ‘In the roll-out to other zones, we plan several changes, like offering on-site trainings and change management sessions to advocate the use of the tool. We also want to increase supportive supervision by paying regular visits and contacting doctors by phone and e-mail.’ Another participant suggested identifying a ‘telemedicine champion’ to receive training instead of asking hospitals to select someone to send to the training. The latter approach usually results in an older, higher-level clinician being trained, who may be less like to train others or to perceive that he/she has the time for telemedicine. Peer-to-peer training of this champion or another enthusiastic clinician was mentioned as another viable solution.

Participants also had suggestions for improving the iPath tool. It was suggested that doctors should receive an SMS alert when a new case has been uploaded so they can provide consultations more quickly. Also, it would be helpful if iPath users could see who else is online.

Platforms/Media/Materials Used

While many platforms are used for telemedicine, much of the discussion focused on iPath, which has more than 300 participants in Tanzania. (The Tanzania website is <www.telemed.ipath.ch/tanzania>.) ELCT has a coordinator that monitors the group in which Tanzanian institutions participate. When a new case is posted, an e-mail goes out to all
registered consultants. If no one responds within 24 hours, the coordinator may have to call some of the consultants, but this rarely happens.

**Future Planning/Vision**

At the end of the session, participants were asked to share their vision for the use of telemedicine in Tanzania by 2012. The technology is definitely taking hold. Most said they would like to see 80 per cent of faith-based hospitals and 40 per cent of public hospitals practicing telemedicine. Accomplishing this will require the development of ICT and telemedicine training modules; integration of telemedicine into the curriculum of health care training institutions; and dissemination of this knowledge among hospitals. ‘E-learning is not yet integrated in the curriculum; we are late and we need to lobby,’ one participant claimed. During future training sessions, particular attention should be paid to bringing about the necessary changes in attitude and behaviour. Other recommendations included making iPath compatible with other software and developing a cost recovery model. Finally, participants recommended that all existing telemedicine networks within Tanzania (AMREF, Bugando, Aga Khan, Mikocheni, Regional Dermatological Training Centre, Peramiho, ELCT, and Ocean Road) be integrated. An online discussion group and a wiki (a web page that allows any user to contribute or modify content) could be used to collect all data, along with information on lessons learned, challenges, and best practices.

The third national telemedicine conference is planned for late 2008. AfyaMtandao, the ICT for Health network that facilitated this conference, will continue to support the raising of awareness and sharing of knowledge for the rest of the year. Before the ELCT project is rolled out to Lake Zone in September, AfyaMtandao will organise an awareness-raising session on telemedicine for HCWs in that zone. In October, a knowledge-sharing workshop is planned at which active and less active users of iPath will exchange experiences. It is hoped that this exchange will result in a more active use of telemedicine for the benefit of both doctors and patients.

**mHEALTH WORKSHOP: MOBILE PHONE APPLICATIONS FOR PUBLIC HEALTH, DAR ES SALAAM**

**Date of Conference:** August 7, 2008

**Data Source for Summary:**

- Attendance at conference by one assessment team member

**Description of Programme Activities**

The term *mHealth* (mobile health or mobile eHealth) denotes medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, PDAs, and other wireless devices. mHealth applications include the use of mobile devices for the collection of community and clinical health data; the delivery of health care information to practitioners, researchers, and patients; real-time monitoring of patient vital signs; and direct provision of care (via mobile telemedicine).

About 45–50 participants attended this workshop, sponsored by the Mennonite Education and Development Association (MEDA) and D-Tree International. Participants included development partners, technology companies, and one or two representatives from the MoHSW.
mHealth is a rapidly growing area, with several consortiums and conferences taking place, including OpenROSA. The technology has applications in several areas:

- **Outreach**—use of mobile phones for awareness campaigns, adherence reminders, and educational games
- **Telemedicine**—consultation in remote areas, doctor-to-patient and doctor-to-doctor; monitoring of treatment referrals; specialist consultation; and monthly case conference phone calls
- **Data gathering**—surveys and disease surveillance using such software as Pendragon and EpiSurveyor
- **Clinical care**—loading of algorithms and protocols into PDAs, emergency response, and supportive supervision

### Case Presentations from Participating Organisations

**Ifakara Health Institute: Use of PDAs for Data Collection**

As mentioned earlier, Ifakara has been using PDAs for several years to gather data for baseline household surveys, morbidity monitoring, and a costing survey. (See the section on Ifakara Health Institute in Section B.2.)

**MEDA and Selcom**

MEDA uses the Tanzania National Voucher scheme to provide insecticide-treated bednets for women and infants in clinics throughout the country. It used to have a paper voucher scheme whereby vouchers with bar codes were printed in South Africa and then distributed to reproductive child health (RCH) clinics. Women received the vouchers during either their first pre-natal visit or their first infant vaccination visit. MEDA works with more than 4,500 RCH clinics and more than 7,000 mosquito net retailers and wholesalers. To date, 3.8 million vouchers have been redeemed (75 per cent of those disbursed). It took an average of 183 days for the vouchers to come back to MEDA, making reporting difficult.

MEDA partnered with Selcom Wireless (a telecommunications company) to develop an SMS text system for vouchers. Selcom specialises in SMS products and services, such as lottery tickets. An SMS application is loaded onto a SIM (Subscriber Identity Module) card and then loaded into a mobile phone or PDA. A woman then sees an RCH worker, who enters data about the woman into a cell phone. The data are sent to a database and then verified for eligibility. A voucher number is sent back to the RCH worker, who writes it on a piece of paper and gives it to the woman. When she takes it to a retailer, the retailer sends the voucher number to MEDA by SMS. Real-time reports on the redemption rate of the vouchers can be printed out. MEDA can also track how much credit retailers have and cash out with either a check or cell phone credit. The programme is web managed.

**Phones for Health**

Phones for Health uses mobile phone infrastructure to support the scale-up of TB, HIV, malaria, and other health programmes. (See the discussion of Phones for Health in Section B.2.) Its applications are linked with the Tanzania HMIS to enable real-time data collection, analysis, mapping, and reporting via PC, cell phone, PDA, landline, or payphone. The programme is working with the National AIDS Control Programme (NACP) on using this application to report care and treatment data from Mwanza and Singida regions as pilot sites. It is also working with the Blood Transfusion Service on a blood donor messaging
system and with Integrated Disease Surveillance and Response (IDSR) on disease surveillance and response. Other applications being explored are drug distribution, adherence support, and patient education. One challenge is identifying a uniform health facility coding system, as many different partners are working on data collection for health facilities, and these efforts are not coordinated.

University of Dar es Salaam, District Health Information System (DHIS)

The DHIS collects health data at the district level. It has been fully implemented in Zanzibar since 2005 and piloted in three districts on the mainland. The initial system is access-based, but piloting of a web-based version in Zanzibar has begun. There are four modules: Data Entry, Data Export/Import, Data Reporting, and Data Analysis. An SMS gateway system was recently added so districts can send the data via SMS. The biggest challenge for the programme is uniform facility names and codes.

Population Services International (PSI): Using PSI-NDEGE, a Computerised Reporting System

PSI is an international NGO involved in health communication, distribution of mosquito nets, and family planning. Wishing to create a computerised programme reporting/monitoring system, PSI partnered with CESAI Tanzania, a local IT partner. Since CESAI has staff throughout the country, including remote areas, it wanted a new system that would ensure accurate and timely programme reporting. With PSI-NDEGE, workers can send report data via computer or cell phone first to the regional manager, then to the zonal manager, and finally to the main database. Each level has access to its own data and those at lower levels. The challenges have been internet speed and reliability, data quality, the need to make the process simple and user-friendly, and development of a culture of data compliance and integrity. The next application will be a web- and SMS-based version of the Travel Advance and Reimbursement system.

Change Group, University of Washington

Change Group has been developing two applications:

- Comm Care—This application was developed for community health workers (CHWs) in Uganda to collect and disseminate data from home visits. Each CHW is responsible for 200 households and visits 5–10 households a day. CHWs have several tools on their mobile phones:
  - Checklists for patient assessment
  - Medical protocols for screening
  - Scheduling software
  These tools help managers monitor and supervise a large number of CHWs, ensure that all screening questions are asked, and generate reports.

- Paediatric dosing via SMS—Because paediatric anti-retroviral (ARV) dosing is based on a child’s height and weight, mistakes in dosing can be common. Change Group has developed an application whereby clinicians can calculate dosing using an SMS text programme on their mobile phones. The clinician sends a request via a cell phone that is linked to a computer, and a message is returned with the correct dosing, the dosing rules, and so on.

\(^7\) Ndege means bird in Kiswahili.
U.S. Centers for Disease Control and Prevention, President’s Malaria Initiative

In 2005, Zanzibar had a malaria prevalence of about 30–35 per cent. As of today, the prevalence has dropped to less than 1 per cent. This decline is a result of a concentrated and coordinated effort that includes use of bednets, indoor spraying, universal access to treatment, and treatment of pregnant women. To advance to the next phase of disease elimination/eradication, a scaled-up surveillance programme was needed to ensure a quick response to any detected new cases. A weekly reporting system from health facilities was necessary. Partnering with Selcom Wireless, the programme has started implementing an SMS reporting system at ten health care facilities (five on Unguja and five on Pemba). Data are transmitted weekly by cell phone to both the District Medical Officer and the Zanzibar Malaria Control Programme via a secure website. The ten facilities are all conducting rapid diagnostic testing. The next step is to provide this system to the remaining 140 health care facilities. Each facility is provided with a dedicated cell phone for malaria surveillance, and two staff members from each facility receive a 3-day training programme.

D-Tree International

D-Tree International has two clinical applications using PDAs:

- To support task shifting, D-Tree has developed an assessment tool that can be used by a counsellor at a care and treatment clinic (CTC) to assess whether an HIV-positive patient on ART needs to see a doctor or can just receive a refill and counselling. The patient’s record is already loaded on the PDA, and the counsellor can confirm the regimen each time. The PDA can also alert the clinician when it is time for a CD4 test and chart the patient’s weight over time.
- To support HCWs’ adherence to correct protocol use, D-Tree has loaded the IMCI protocol into a PDA. This application is being piloted in collaboration with Ifakara Health Institute.

Future Planning/Vision

Participants at the conference proposed the following steps for moving forward:

- Develop better collaboration and coordination among projects, as there appears to be a great deal of duplication.
- Create a briefing document for the MoHSW.
- Organise as a collective to present ideas to the MoHSW. Perhaps suggest a technical working group with the MoHSW, and include these applications in upcoming funding proposals, such as PEPFAR and Global Fund Round 9.
- Develop a list of projects and contacts from this workshop.
- Hold another workshop or devise some other means of updating participants.
- Build the capacity of local partners to develop/apply mHealth programmes.
B.4 Visits to Tanzania Information Technology/Distance Learning Organisations

This section summarises the following visits to Tanzania information technology (IT)/distance learning organisations:

- AIM Consultants, Dar es Salaam (page 240)
- MoHSW IT Unit, Dar es Salaam (page 240)
- Soft-Tech Consultants, Dar es Salaam (page 241)

The section ends with a summary of responses to IT questions from these three organisations (page 242).
AIM CONSULTANTS

Date of Site Visit: June 20, 2008

Data Source for Summary:

- Interview with one consultant

Website: www.aimfirms.com

Activity Description

AIM is an IT services company supporting the Dar es Salaam and Arusha regions. AIM provides comprehensive IT support and services to small and medium-sized businesses, individuals, and governmental and non-governmental organisations.

Services offered include hardware or software purchasing advice, development of an internet strategy, choosing of new suppliers, recruiting of staff, individual help desk assistance, software and hardware troubleshooting, intranet (LAN) and internet troubleshooting, server support, domain or workgroup management and maintenance, and network security. AIM Consultants can also provide valuable help when multiple IT suppliers give conflicting information, and an independent viewpoint is required. AIM considers its role to be an addition to an organisation’s internal expertise, and hopes to allow employees to focus on their work instead of computer problems.

MOHSW IT UNIT

Date of Site Visit: June 20, 2008

Data Source for Summary:

- Interview with one official of the IT Unit

Website: None

Activity Description

The MoHSW IT Unit provides IT support services to other units of the MoHSW. It was responsible for the installation of computers and VSAT terminals at all of the ZHRCs, and provides user support, develops custom software, maintains the MoHSW website, and provides ICT inputs.

In 2008, the MoHSW acquired VSAT Ku-band internet connectivity from Satcom Networks Africa Ltd. for five ZHRCs (Lake, Southern, Central, Eastern, and Southwestern). This contract is for bandwidth shared among the ZHRCs, which means that if one of them is using the internet heavily, less bandwidth will be available to the others. The bandwidth paid for is rather low (64 kilobits per second download and 32 kilobits per second upload). The five ZHRCs share the same Internet Protocol (IP) address. A LAN with 20 data points and 20 voice points was installed at each ZHRC. National Expansion of TEHIP Tools Strategy (NETTS), a project at the MoHSW, provided an additional ten PCs and two laptops, as well as an LCD projector, to each of the eight ZHRCs. TEHIP (Tanzania Essential Health Interventions Programme) consists of training packages such as Planning and Reporting (PlanRep), Strengthening Health Management (SHM), Integrated Management of Childhood
Illness (IMCI), and others. The project also produced a report in April 2008 titled *LAN and Internet Connectivity for Five Zonal Health Resource Centres* that outlines such challenges as a lack of furniture, insufficient electrical outlets, and a lack of software CDs. The report notes that periodic IT visits from the MoHSW IT Unit to the ZHRCs would be helpful to ensure that the equipment is being managed properly and is in working order. Some improvements related to internet speed are still needed, and the report suggests installing phone extensions at the ZHRCs as well.

Recently, the IT Unit installed the following equipment:

- In both Central and Eastern ZHRCs, after the LAN and internet service were ready, 15 new computers were installed; three laptops and the LCD projector were also tested and updated.
- In Southwestern ZHRC, after the LAN and internet service were ready, 3 new computers were installed, and three laptops and the LCD projector were tested and updated. The remaining 12 computers could not be installed because the computer room was not ready.
- In Southern ZHRC, 5 desktop PCs with uninterruptible power supplies and one laptop were delivered. A data cabinet, Cisco switch, Linux box, and voice panel were also installed.
- In Lake ZHRC, after the LAN had been installed, 5 computers were installed. Other equipment supplied included five uninterruptible power supplies, one laptop, a data cabinet, a Cisco switch, a Linux box, a voice panel, and a VSAT dish.

The MoHSW envisions providing technical support for distance learning and for communication between health institutions, helping to increase medical knowledge by providing the technological capabilities needed for information sharing. The MoHSW thinks people in the regions and districts would likely have problems with the technology, but could call on the IT Unit for assistance. Training in how to use e-mail and the internet would also be needed. The IT Unit representative interviewed noted that most areas have IT support available from local companies, but that such support may be limited in Kigoma, Rukwa, and Lindi regions.

The MoHSW believes that, to facilitate internet access for the ZHRCs, it may be able to negotiate with Tanzania Telecommunications Company Limited (TTCL) for reduced tariffs, thus reducing communication costs. An alternative to costly VSATs for communicating among the ZHRCs would be to use leased lines, which are currently being used by the Ministry of Finance and the Bank of Tanzania. The interviewee also said a case could be made for creating an ICT unit within the MoHSW.

**SOFT-TECH CONSULTANTS**

**Date of Site Visit:** June 20, 2008

**Data Source for Summary:**

- Interview with one marketing executive

**Website:** [www.stcl.com/training](http://www.stcl.com/training)
Activity Description

With 168 employees, Soft-Tech Consultants is one of the largest IT and telecommunications service providers in Tanzania. Established in 1993 to meet the local need for IT services and training, Soft-Tech is committed to developing local expertise in the IT profession and is a leading IT training provider in Tanzania. The company consists of Soft-Tech Consulting Services; Learn IT, the provider of IT training; Satcom Networks Africa Ltd., which offers telecommunications services to clients; and eCard Solutions, which provides support for banking and ATM services. Learn IT, Soft-Tech’s IT training company, provides comprehensive course materials, developed mainly by partner institutions. Courses are face-to-face, and range from certificate programmes to a bachelor of science degree. Learn IT hopes to offer a masters degree in the future. Soft-Tech Consulting has international affiliations with such companies as Microsoft, Oracle, Epicor, Tata Consulting Services, Dell, Hewlett-Packard, and Cisco.

Soft-Tech uses virtually every technical platform. In addition to satellite communications, IT training, electronic transactions, and other software applications, the company provides digital videoconferencing for business clients, although this service is not usually international in scope.

INFORMATION TECHNOLOGY QUESTION AND ANSWER: A SUMMARY OF RESPONSES FROM AIM CONSULTANTS, THE MoHSW IT UNIT, AND SOFT-TECH

Are there any restrictions on Voice over Internet Protocol (VOIP) (internet-based voice communications)? There are no restrictions on VOIP in Tanzania. At one time, Tanzania Communications Regulatory Authority (TRCA) placed restrictions on VOIP, but these restrictions have been loosened so that conferencing over the internet is now possible anywhere in the country. VOIP can also be used with VSATs.

What is the regulatory environment in Tanzania? No regulatory constraints exist that would prevent the installation of any ICT system.

What are the political constraints? There are no significant political constraints. The Tanzanian government has established an e-Government initiative and has earmarked TSH 200 billion (about USD 1.7 million) to build a national fibre optic network, planned to be operational in 2009 (see below for more information).

Who are the major players in providing internet services in Tanzania? There are six major internet service providers (ISPs): Simbanet, A-Link, Iway, Africaonline, Cats-Net, and TTCL. TTCL is a parastatal and has the widest coverage, encompassing every region. Most ISPs are based in Dar es Salaam but have representatives in regions such as Arusha, Mwanza, and Mbeya. Wireless is generally available, as well as internet services via cell phone satellite with a portable modem. Vodacom, Zain, and Zantel all provide this service.

What is the reach of the internet in Tanzania? One interviewee said, ‘Anything is possible in Tanzania if you are willing to pay the price.’ Basic internet service exists at all levels. The government Postal Department has internet capability in every district in the form of a business centre at the post office. Internet service is generally expensive. There is less than one fixed line per 200 people, and local call charges are about USD 2.50/hr. The country’s limited telecommunications infrastructure and high tariffs resulting from a lack of...
competition are likely the most important factors restricting the use of the internet in Tanzania. Use of a dial-up connection for 1 hour per day plus an internet subscription fee of USD 30–40 per month costs a total of more than USD 100 a month, which means that only the elite are able to afford extensive personal use of the internet.

While there is a lack of competition in the fixed network, Tanzania has several cell phone companies: Zanzibar has five, while the mainland has six. Following the introduction of private operators in 1994, the cellular market began switching from analogue to digital systems on GSM900/1800, and the licensing policy shifted from a regional to a national level, the only exception being Zantel’s ‘regional’ license for Zanzibar.

**Is there any relief from high internet connectivity costs?** Currently, East Africa is the only region in the world that has neither intra-African nor direct access to worldwide international cable networks. The region instead relies on expensive satellite communications. Data costs in the region are among the highest in the world, and thus bandwidth is very expensive in Tanzania: it costs more than USD 1,100 a month per ZHRC for VSAT at five ZHRCs. Fibre optic infrastructure is expected to relieve the problem (see also Chapter 6). Several undersea fibre optic cable projects are under way in the East African region:

- **SEACOM** is a submarine fibre optic communications cable in the early stages of construction on the east coast of Africa. The cable will link South Africa, Madagascar, Mozambique, Tanzania, Kenya, India, and Europe. It is expected to be completed in June 2009.
- The **East African Submarine Cable System (EASSy)** is a fully integrated multi-technology network that is being created by a consortium of governments and telecom operators (www.eassy.org). It is an initiative to connect countries of East Africa to the rest of the world via a high-bandwidth fibre optic cable system, and is considered a milestone in the development of information infrastructure in the region. Activation of the undersea cable should result in some pricing relief, although it will affect mainly international calling.
- The **East African Marine System (TEAMS)** is an initiative spearheaded by the government of Kenya to link the country to the rest of the world through a submarine fibre optic cable. TEAMS was first proposed as an alternative to EASSy. The Kenyan government had grown frustrated with the ownership model favoured by South Africa, the time the EASSy project was taking, and what was perceived as an attempt by South Africa to control the cable. As a result, in November 2006, the Kenyan government decided to partner with the Emirates Telecommunication Establishment (Etisalat) to build its own fibre optic cable. At the same time, however, the Kenyan government remains committed to EASSy.

As discussed in Chapter 6, a national ICT infrastructure backbone is presently being built from the ground up by TTCL, the Tanzania Railways Corporation, TANESCO, and Songas. The estimated completion date is 2010. The project will link with SEACOM and EASSy to augment the undersea cables and reach all regions of Tanzania. Presently, part of this fibre optic infrastructure exists between Dar es Salaam and Mwanza.

**Is videoconferencing feasible at this time?** Videoconferencing is feasible, but would be very expensive. One interviewee suggested a pilot phase before widespread roll-out. A contract would need to be established with an ISP, and line connectivity would have to be leased to connect all of the participating sites. TTCL offers digital subscriber lines (DSL),
and Vodacom offers wireless services. Vodacom has wide coverage and good speed. To connect remote rural sites would require a combination of wireless and VSAT.

Videoconferencing has been used by governmental and non-governmental agencies for international calls via satellite. It was also noted that digital videoconferencing can occur over bandwidths as low as 256 kilobits per second using MPEG-4 compression algorithms.

**Are there any other challenges?** Power outages are frequent in Tanzania (see also Chapter 6), and it can take a long time to restore services. The weather can create havoc with electrical service in some regions. There are few high-power voltage lines. Technology such as asymmetric DSL (ADSL) has been slow to roll out.
B.5 Review of Distance Learning Programmes in Areas with Contexts Similar to That of Tanzania

This section summarises the review of distance learning programmes with contexts similar to that of Tanzania:

- Africa Teledermatology Project (page 246)
- African Medical and Research Foundation (AMREF) (page 247)
- Caribbean Health Leadership Institute (CHLI) and University of West Indies (UWI), Jamaica (page 249)
- HIV [e]Ducation (page 250)
- JHPIEGO, Distance Learning Course for ART Providers, Zambia (page 252)
- Johns Hopkins Centre for Clinical Global Health Education (CCGHE) (page 253)
- Learning for International Non-Governmental Organisations (LINGOs) (page 258)
- Mildmay Centre, Uganda (page 260)
- Mindset, South Africa (page 262)
- Réseau en Afrique Francophone pour la Télémédecine (RAFT) (page 264)
- University of Swaziland Institute of Distance Education (IDE) (page 266)
- Videoconferencing at three South African Universities (University of Stellenbosch, University of Pretoria, and University of Freeestate) (page 268)

In addition to site visits conducted in Tanzania, I-TECH reviewed global distance learning programmes in areas with contexts similar to that of Tanzania. Programmes were selected if they had a strong international reputation for the training of HCWs through distance learning. Programmes in Africa were given priority because of the potential similarities in resources, infrastructure, and constraints.
AFRICA TELEDERMATOLOGY PROJECT

**Date Information Was Collected:** August 2008

**Data Source for Summary:**
- Review of website

**Website:** http://africa.telederm.org/

**Description of Programme Activities**

The purpose of this project is to establish a virtual collaboration among partners in the United States, Austria, and Africa—the dermatology departments at the University of Pennsylvania in the United States, the Medical University of Graz in Austria, the University of Botswana, Makerere University and Mbarara University of Science and Technology in Uganda, and various other universities and organisations in Africa. The project was undertaken to provide dermatology support to physicians, dermatologists, and HCWs in hospitals and clinics throughout Africa. The programme uses telemedicine to connect two or more medical centres and enable the exchange of expert medical information, including consultation services, discussion pertaining to diagnosis and management of patients with skin diseases, links to educational resources, and access to a dermatologic curriculum created specifically for African sites. A secondary aim of the project is to establish and secure an active channel and platform for collaboration in dermatological research through teledermatology across Africa.

**Target Population**

The project targets medical specialists and health personnel including physicians, dermatologists, and HCWs in hospitals and clinics in Uganda, Botswana, Malawi, Swaziland, Burkina Faso, and Lesotho.

**Successes and Advantages**

- Telemedicine has the potential to provide developing countries with qualitative and quantitative improvements in medical care. The inherent visual nature of dermatology makes teledermatology easily applicable to HCWs’ daily work.
- Africa has a limited number of qualified dermatologists. Teledermatology offers a prompt channel for long-distance consultation and thus a means of improving medical care for skin diseases.

**Future Planning/Vision**

The programme aims to create a unique online archive of tropical skin conditions that can serve as a source of educational material for the training and updating of medical specialists and health personnel. If realised, this archive would have potential applicability as a rich distance learning resource.
AFRICAN MEDICAL AND RESEARCH FOUNDATION (AMREF)

Date Information Was Collected: August 2008

Data Source for Summary:

• Review of website

Website: http://www.amref.org/info-centre/amref-courses--training-programmes/elearning-programme/

Description of Programme Activities

AMREF is an organisation based in Kenya with offices in Uganda, Ethiopia, South Africa, Sudan, and Tanzania. Students in health-related fields come from more than 40 countries in Africa to train at institutions in these six countries. Through its training programmes, AMREF aims to strengthen the capacity and capability of health and health-related professionals and institutions. It is the first organisation in East Africa to provide continuing education to HCWs through distance learning. In 2005, AMREF partnered with the Nursing Council of Kenya, Accenture (a global technology services company), the Kenya Medical Training Colleges, several private and faith-based nursing schools, and the Ministry of Health Kenya to pilot a country-wide e-learning programme for upgrading nurses in Kenya. The course was formerly print-based. AMREF also runs ten print-based distance learning correspondence courses for HCWs that range from 8 to 16 units and cover such topics as child health, communicable diseases, non-communicable diseases in adults, community health, environmental health, family planning, helping mothers to breastfeed, immunisation, mental health, and obstetrics and gynaecology. Information on the courses can be found at <http://www.amref.org/info-centre/amref-courses--training-programmes/distance-education-programme/>.

E-learning

A pilot started with four schools and 145 students, with the aim of upgrading 22 000 community health nurses from enrolled to registered within 5 years. ENs make up 70 per cent of nurses and 45 per cent of the health workforce in Kenya. They are the first point of contact for communities, but are inadequately skilled to manage new and re-emerging diseases such as HIV and AIDS. Thus their continuing professional development is necessary to improve nursing care standards in Kenya and achieve the country’s health-related Millennium Development Goals (4, 5, and 6). The upgrading curriculum comprises four modules: General Nursing, Reproductive Health, Community Health, and Specialised Areas. Theory is provided through a blend of scheduled face-to-face sessions and self-paced computer-based instruction. In addition, students are required to complete 42 weeks of clinical experience. After completing the four modules, students sit for their college finals and the Nursing Council of Kenya licensing exams. AMREF plans to use this programme as a model for other African nations struggling with critical nursing shortages.

Print-based Correspondence Courses

The print-based courses are of two types. The first is based on AMREF manuals; students are expected to read the manuals as they proceed through the unit. The second type of course is self-contained, with each unit including the necessary basic information for the learner.
Students can refer to any books on the subject to enrich their knowledge, but need not do so to complete the assignments.

**Target Population**

AMREF programmes target health care professionals, including nurses.

**Successes and Advantages**

AMREF’s achievements in distance learning include the following:

- Twenty-seven medical training colleges and nursing schools participating in its distance learning programmes, including AMREF’s Virtual Nursing School
- More than 100 computer-equipped training centres established in eight provinces, including rural, remote, and marginalised districts (e.g., Garissa and Dadaab Refugee Camp in the North Eastern Province of Kenya)
- More than 4 000 nurses enrolled in both e-learning and print-based courses
- More than 300 computers installed in training centres
- More than 192 implementers trained in IT skills

The AMREF programmes offer many benefits:

- Kenya has a severe shortage of nurses (one RN for every 27 000 citizens). The e-learning programme is revolutionising health care by creating an electronic infrastructure for accelerated education of nurses, enabling continued service provision, instant application of learning, and improved quality of care.
- The training is flexible, enabling students to learn anytime and anywhere, and interfering minimally with the provision of health care services.
- The interactivity of e-learning facilitates nurses’ acquisition of IT skills.
- The programmes provide access to courses on the students’ schedule, regardless of location, through learning centres that are open around the clock.
- The programmes are more cost-effective than residential programmes, in part because the courses can be completed more quickly.
- Electronic courses are easy to revise, enabling them to respond to immediate training needs that may arise. An example is a unit on HIV and AIDS.
- The programmes can reach thousands of HCWs simultaneously.

No challenges or disadvantages of the programmes were identified on the website.

**Participant Testimonial from the Website**

Jennifer Kidaha is a 40-year-old EN in western Kenya. She spent 10 years trying to gain admission to a nursing college so she could earn her RN certification. Each year she was turned away because of overcrowded classrooms. When she learned about the e-learning pilot, she did not hesitate to enroll. According to Jennifer, ‘I had been trying for so long that it seemed too good to be true. To make matters even better, this course will take a much shorter time than the regular one I had been trying to get into.’ With e-learning, Jennifer, who started the programme in September 2005, could complete the coursework in 1 1/2 years, as opposed to 3 years for regular classes.
CARIBBEAN HEALTH LEADERSHIP INSTITUTE (CHLI) AND UNIVERSITY OF WEST INDIES (UWI), JAMAICA

Date Information Was Collected: September 2008

Data Sources for Summary:

- Review of website
- Telephone interview with one IT specialist

Website: http://www.gochli.org/

Description of Programme Activities

CHLI and UWI, located in Jamaica, conduct a year-long course in management and leadership for health professionals in the Caribbean through distance learning. This is a new course that began with its first cohort in April 2008. The course is designed to enhance the skills and effectiveness of leaders in the Caribbean health sector, including leaders of programmes in HIV and AIDS. The focus of the programme is personal and professional development, with a view to strengthening leaders who will, in turn, influence the performance of work teams and contribute to the improvement of national and regional health systems. The principal aim is not academic qualification, but personal learning and acquisition of knowledge that can be applied in workplace settings. The programme is also expected to interface with post-graduate academic leadership programmes at the University of the West Indies. The course is funded through PEPFAR.

Participants begin with a face-to-face 3-day interactive workshop where they learn the principles of adult learning, review the work for the self-study portion of the programme, and meet their classmates and mentor. The self-study distance learning component takes place over the next 8 months through:

- Online, live teleconferences and seminars incorporating the core curriculum
- A series of live or taped interviews with selected leaders and a Book Watch, all moderated by faculty members
- Action learning projects, which are carried out in small teams
- Guided reflection on the interactions and actions of the team in problem-solving exercises
- Practice in the skills involved in problem solving through assignments
- Widening and deepening networks with other leaders through assignments

Following this period of study, another face-to-face retreat takes place to continue supervised learning and reflection. The agenda includes a focus on networking, meta-systems leadership, and case studies of best leadership practices. Action learning teams make an interim presentation of their work and receive feedback.

The final portion of the course is an approximately 4-month period comprising additional webinars (web-based seminars) and interaction between mentors and their action learning teams. The action learning teams have approximately 3 months to complete their respective assignments and make final presentations via a webinar.
Target Population

The programme targets established and emerging leaders from all areas of the health sector across the Caribbean; its initial emphasis is on high-level leaders and managers. Applications are accepted from leaders directly involved in national programmes, as well as from those who oversee these programmes and determine policies and priorities in health care.

Platforms/Media/Materials Used

Adobe Connect Pro Live is currently used as the platform for the webinars.

Challenges and Disadvantages

Technical issues are preventing Adobe Connect Pro Live from running smoothly. CHLI has obtained a user license through the Latin American affiliates of Adobe, which provides them with some technical support. The programme has been attempting to use video with sites logged in, but has experienced difficulty in doing so. Audio interruptions are common and severely compromise the sessions.

HIV [e]DUCATION

Date Information Was Collected: June 2008

Data Sources for Summary:

- Review of website
- E-mail correspondence with programme administrator

Website: http://www.hiveducation.net/

Description of Programme Activities

Health [e]Foundation is a non-profit organisation based in Amsterdam, the Netherlands. It uses a distance-based e-learning system to provide sustainable training and education of HCWs in resource-poor settings so they can manage and prevent poverty-related diseases (HIV and AIDS, TB, and malaria).

The foundation’s HIV [e]Ducation blended learning programme trains HCWs across nine countries in the use of ART to treat HIV patients. Computer-based courses lasting 12 weeks cover theoretical implications of treatment and include pre- and post-course questions, post-test results, and evaluations. Students receive USB (universal serial bus) memory sticks for the self-study modules, which are written by content experts from around the world and include clinical cases written by local experts in the student’s country. References used for the content of the modules are available on the USB memory stick as PDF files, as are the most current treatment guidelines. Every participant is assigned a special e-tutor, who can be reached by e-mail for help. The e-tutor follows each student through a learning management system. The programme can be completed on- or offline. Health [e]Foundation is currently expanding the programme to include topics other than HIV.

Participants have an average of 3 months to study the content of a computer-based programme at their own pace and time. Since the majority of participants come from areas
without reliable internet connections, most follow the programme offline via the USB memory stick. If the internet is available, participants can synchronise their stick to obtain updated modules and guidelines, upload their test scores to the database, and communicate via e-mail with their e-tutor.

The course includes a face-to-face component. In a 2- to 3-day workshop, specific topics covered by the programme are discussed. Every workshop has a balanced schedule that includes lectures, interactive clinical case discussions, and individual and group exercises. Presentations are given by local experts together with an international faculty, and an effort is made to have people living with HIV and AIDS help facilitate the programme. Teamwork is promoted, and participants are trained in communication skills. To evaluate progress, participants are asked to complete the same clinical case study they were given during the initial meeting. The content of the computer-based programme, participants’ experience with its use, and the workshop are evaluated in focus groups, as well as with questionnaires.

During the initial meeting, pictures are taken of every participant. These pictures are posted on the participant portal with personal contact details, forming a virtual class. This portal can be accessed with a personal logon code and password, which enables participants to contact one another. The latest guidelines and references can be downloaded from the portal as well. There is also a forum that can be used by all participants in all courses in all countries to discuss difficult cases, share knowledge and experiences, and exchange information about upcoming events.

**Target Population**

Participants are HCWs from the Caribbean, India, Mozambique, the Netherlands, Uganda, Kenya, Tanzania, Malawi, and Indonesia. The programme in Tanzania just started. HIV [e]Ducation has developed an HIV epidemiology module in collaboration with the Tanzanian MoHSW. The courses are generally 12 weeks long and aimed at providing continuing education in HIV and AIDS for HCWs.

**Successes and Advantages**

- Together with the software developer, TinQwise, HIV [e]Ducation decided to upgrade to a more powerful software platform called EEDO in October 2006. This platform allows greater flexibility in the development of materials.
- Computer access has not been a significant problem, generally being available to students through their workplace or a friend or colleague. In those rare circumstances in which a student lacks access to a computer, HIV [e]Ducation allows the student to borrow a laptop.

**Challenges and Disadvantages**

- The major costs for HIV [e]Foundation are related to IT. The costs for development and maintenance of the e-learning programme are high. The Learning Management System that is included in the e-learning programme is an important but expensive tool that cost 1 million euros to develop.
- During the pilot, the memory sticks failed to link up with the internet. There were other software problems as well: students could get a test score of 100 per cent on the pretest just by clicking ‘next’, and after memory sticks has been distributed to participants, the software would not open.
- HIV [e]Ducation attempted to bring second-hand computers into a country in Africa and encountered many problems with customs. The programme administrator
remarked that HIV [e]Ducation would never again try bringing computers into the countries where its programme is offered.

**Platforms/Media/Materials Used**

As noted, the programme uses USB memory sticks for the self-study component and EEDO software. In addition, face-to-face sessions take place at the beginning and end of the course. Participants also have access to an e-tutor throughout the programme and are in communication with classmates through a participant portal.

**Evaluation**

No formal evaluation of the programme has yet taken place. If any aspect of the programme is not working well, participants are invited to provide their feedback through e-mail or during the face-to-face sessions. As noted, the content of the computer-based component, experience with its use, and the workshop are evaluated in focus groups, as well as with questionnaires upon completion of the programme.

**Future Planning/Vision**

HIV [e]Ducation would like to expand its programme to include training on topics related to TB, paediatric HIV, and neglected infectious diseases. It is continuing to expand its project sites and to develop programmes in more languages. It foresees a larger number of participants in its courses in the future.

**JHPIEGO DISTANCE LEARNING COURSE FOR ART PROVIDERS, ZAMBIA**

**Date Information Was Collected:** October 2008

**Data Source for Summary:**

- Review of website

**Website:** JHPIEGO general: http://www.jhpiego.org/.
  Project site: http://www.jhpiego.org/media/featarticles/ft20080200b.htm

**Description of Programme Activities**

JHPIEGO and the U.S. Centers for Disease Control and Prevention (CDC) created a 10-week distance learning course on ART and management of opportunistic infections for patients with HIV and AIDS. The course aims to improve the knowledge and skills of HCWs related to care and treatment for HIV and AIDS to improve patient outcomes. This course began in late 2008.

The project began with a meeting of partners and stakeholders, followed by an orientation for provincial clinical care specialists. The specialists’ roles include enrolling ART teams in the course, administering knowledge assessments, and providing support and supervision to providers as part of their routine visits to ART sites.

The course consists of 12 technical modules covering such topics as ART provision, HIV care for women and children, management of opportunistic infections, and pain management. Modules are given in an electronic multimedia format. Each module comprises a recorded video lecture with visuals presented by a local clinical expert, as well as printed materials
(including tests and assignments, and resources such as clinical guidelines and protocols). Other components include recorded interviews with people living with HIV and AIDS to help HCWs learn the psychosocial aspects of providing care and treatment for these patients.

The course uses a performance and quality improvement approach to help participants transfer their learning into practice at their workplaces. One example of how this is done is the course exercises. The exercises are designed to be team- rather than individual-based to reflect the importance of working as a team to care for patients with HIV and AIDS.

**Target Population**

This course targets teams of ART care and treatment providers, including physicians, clinical officers, nurses, pharmacists, lab technicians, and environmental health technologists. The accompanying exercises guide the performance and quality improvement process carried out as a team. The longer-term goal for this programme is nationwide coverage.

**Platforms/Media/Materials Used**

Participants receive a new module each month for a year. After studying the printed materials and viewing the video lectures, they work in teams to discuss questions and identify gaps in quality of care and feasible ways to address them. This latter part of the course is carried out through a focused assessment at the ART teams’ health care facilities and requires the teams to document their action plans. Based on these action plans and a test of knowledge, participants receive a provider certification at the end of the course.

**Evaluation**

Evaluation of the training involves quarterly knowledge tests administered by provincial clinical care specialists during routine visits. Final exams are given at the end of the year, and learners’ action plans are evaluated by the provincial clinical care specialists. If participants complete the course successfully, they receive a certificate of completion from the Zambia Ministry of Health and go on to implement their action plans.

The programme is planning a more in-depth evaluation to study the impact of the training on provider knowledge, attitudes, and clinical practices; the usefulness of the course content; and the appropriateness of the course format.

**JOHNS HOPKINS UNIVERSITY CENTRE FOR CLINICAL GLOBAL HEALTH EDUCATION (CCGHE)**

**Date Information Was Collected:** August 2008

**Data Source for Summary:**

- Review of website

**Website:** Johns Hopkins CCGHE: http://www.ccghe.jhmi.edu/CCG/distance/
Description of Programme Activities

The Johns Hopkins CCGHE is a collaboration between the Johns Hopkins School of Medicine and the Johns Hopkins Bloomberg School of Public Health. It provides long-term clinical education programmes for health care providers in resource-limited settings. The goals of the CCGHE include the development of in-country expertise in clinical care, clinical training, and evaluation of local clinical outcomes and of sustainable and long-term continuing education programmes for the countries involved. Ways in which the CCGHE pursues these goals include providing distance learning through online courses, a website, and live and pre-recorded webcasts.

Infectious Disease (ID) Live Grand Rounds

Live grand rounds are webcasts presenting slides and video of the weekly grand rounds of the Johns Hopkins Division of Infectious Diseases (ID). DVD-quality high-definition videoconferencing is conducted through Internet2, a network approximately 1,000 times faster than the average home broadband connection. Codian, a manufacturer of videoconferencing structure, provides the platform for the sessions. A faculty member or post-doctoral ID Fellow is invited to discuss two adult and one paediatric clinical cases from the Johns Hopkins Hospital ID service. The presenter generates a differential diagnosis list that is voted upon by both the live and viewing audiences. The presenter then reviews the literature pertaining to the case. The live grand rounds are available as archives for participants to download and view from the CCGHE website. Pre-recorded grand rounds are also available for viewing from the website. The programme has a global audience that includes clinicians from the United States, Africa (Ethiopia, Zambia, Uganda, Democratic Republic of the Congo, and Tanzania), and India. Some sites participate in the live webcasts of other countries (see below), and some are able to view only archived sessions.

U.S. clinicians are able to earn continuing medical education (CME) credit through many of the archived cases. No fee is involved, but participants must register and link to an evaluation/post-test.

HIV Clinical Care Discussions in Ethiopia

The goal of these sessions is for Johns Hopkins ID physicians to share their expertise in HIV with health care providers practicing in Ethiopia. Lectures and case discussions are broadcast live from CCGHE to providers from the Ethiopian Civic Service College, Addis Ababa University, Addis Ababa Federal Hospital, and other private hospitals and clinics in the country. Sessions are transmitted via the World Bank Videoconferencing Facility in the capital city of Addis Ababa.

Each session lasts about an hour to an hour and a half, and sessions are held biweekly. Presenters are from the United States and Ethiopia. High-quality videoconferencing is used, and participants can see each participating site live. During a session, the screen switches among the various sites depending on who is talking; at times the viewer sees all of the sites. The CCGHE physician or a physician at another site serves as a moderator/facilitator of the discussions of the case.

Sessions are archived and can be watched later on the CCGHE website. Additional courses relevant to other Ethiopian health care issues are currently being developed.
**HIV Clinical Case Discussion in India**

This series is similar to the Ethiopian sessions, but involves cases presented and discussed among providers at CCGHE and Byramji Jeejeebhoy Medical College (BJMC) and the National AIDS Research Institute (NARI). The series started in 2007. Centres around India also take part in the ID live grand rounds and watch archived sessions.

In addition, CCGHE has completed a series of clinical case training lectures on HIV and AIDS that are videocast to BJMC. This 8-week programme, ‘HIV/AIDS Practice in Resource Limited Settings’, gives an overview of clinical care for people living with HIV and AIDS to physicians in India.

CCGHE also provided a 10-week lecture course titled ‘Management of Adult HIV/AIDS in Resource-Limited Countries’. Participants took part in scheduled live question and answer sessions with experts from The Johns Hopkins University. Topics included epidemiology, clinical assessment, opportunistic infections, ART, and management of complications.

On October 3, 2006, an interactive HIV and AIDS clinic session was held with eight institutions in the United States and three in India. Using the advanced network of Internet2, the programme linked faculty experts in HIV and AIDS from India and Johns Hopkins using high-resolution, multipoint videoconferencing; digital microscopy; 3-D imaging; and other e-learning tools. The programme consisted of a series of clinical demonstrations followed by discussions.

**Open-Access Courses/Training**

This programme includes archived courses and educational materials developed by Johns Hopkins faculty on various topics. Some courses are in Spanish. The courses consist of one or more of the following: slides, PDF documents, pre-recorded webcasts, and video. All can be downloaded at no cost from <http://www.ccghe.jhmi.edu/CCG/distance/HIV_Courses/>.


**Zambia Online Clinical Training Course: Management of Adult HIV in Zambia**

This course was launched in January 2008 by CCGHE and JHPIEGO, a Johns Hopkins affiliate with a country office in Lusaka, Zambia. The course comprises 22 lectures by experts at Johns Hopkins, JHPIEGO, University Teaching Hospital in Lusaka, and the Zambia Ministry of Health. Courses include Epidemiology and Infection Prevention, Diagnosing and Initial Management, Clinical Manifestations of HIV Infection, and Antiretroviral Therapy. More than 120 physicians, nurses, pharmacists, programme managers, and researchers have enrolled. Participants receive CD-ROMs of the lectures and take pre- and post-tests online. A Certificate of Achievement is awarded to those who score 70 per cent or better on the post-test.
Other Programmes

Aside from CCGHE, The Johns Hopkins University has other programmes related to distance learning and training of HCWs.

**Hopkins AIDS Service Website: [http://hopkins-aids.edu/](http://hopkins-aids.edu/)**

This website offers a comprehensive HIV guide that includes the latest information on HIV diagnosis, drugs, management, and pathogens. It is accessed by clinicians in more than 82 countries and receives more than 2 million hits each month. The goal is to upgrade AIDS care and research worldwide. Developers post the latest findings from more than 40 medical journals on the site each month. The online HIV guide is available for downloading onto a Blackberry or hand-held PDA.

**Johns Hopkins Point of Care Information Technology (POC-IT) Centre Website: [http://www.hopkinsmedicine.org/poc-it](http://www.hopkinsmedicine.org/poc-it)**

The Johns Hopkins POC-IT Centre is another online resource for clinicians treating patients with HIV. The site provides electronic evidence-based clinical decision-support guides to help health care professionals raise the standards of care and improve patient safety. These guides are accessible through the web and mobile technologies designed for use at the bedside in both primary and specialty care clinical settings. The site also offers CME materials developed by the Johns Hopkins Office of Continuing Medical Education, which provides CME accreditation for the content of ‘CME Dialogs’. Modules are interactive multi-media programmes featuring an expert giving a 1-hour lecture. There are also 15-minute web-based CME activities (called CME POC-IT) that are worth a small amount of CME credit.

**USAID Global Health E-Learning Centre: [http://www.infoforhealth.org/elearning](http://www.infoforhealth.org/elearning)**

The INFO project, based out of the Johns Hopkins Bloomberg School of Public Health’s Centre for Communication Programme, aims to provide global leadership in knowledge management related to reproductive health. The project targets policy makers, health officials, programme managers, educators, trainers, donors, academics, and researchers. The USAID Global Health E-Learning Centre offers a variety of courses that learners can use to increase their knowledge in the area of public health and access up-to-date technical information. All courses are free through the centre’s website and can thus be accessed from any place at any time, providing flexibility for practicing HCWs.
Centre for Teaching and Learning with Technology (CTLT):  
http://www.jhsph.edu/ctl/index.html

The CTLT, based out of the Johns Hopkins Bloomberg School of Public Health, targets research scientists and public health professionals. By combining technology with instructional design, the CTLT aims to assist researchers, public health professionals, faculty, and students in learning online, as well as in face-to-face classroom settings. The CTLT provides services to the Bloomberg School of Public Health by training faculty and developing educational materials. Its programmes include the following:

- An internet-based master of public health programme that began in 1996. Instruction is provided through online chat rooms, e-mail, bulletin boards, and synchronous communication sessions.
- Public health training modules for domestic public health training professionals. Topics include public health preparedness and patient safety.
- Public health content posted to the John Hopkins OpenCourseWare website (http://ocw.jhsph.edu/). Courses offered on this website are free to the public and include John Hopkins’ most popular public health–related courses. Topics include adolescent health, nutrition, HIV and AIDS, and many others. Online learners can access syllabi, lectures, resources, and an image library.
- A family planning research knowledge management database being produced by a collaboration between the USAID INFO Project and the CTLT. The aim is to strengthen the knowledge and skills of those working in the field of family planning through courses, tools, and other resources. The intended audience includes health care associations, universities, and pharmaceutical firms.

**Target Population**

The above programmes target health care providers at multiple levels:

- Physician specialists/consultants
- Primary care physicians
- Nurses
- Paramedical workers
- Pharmacists

CCGHE works with India, Ethiopia, Tanzania, Zambia, the Democratic Republic of the Congo, and Uganda. Its courses and website are available to the public but aimed at clinicians treating and caring for patients with HIV and AIDS.

**Platforms/Media/Materials Used**

Sites taking part in the webcasts are recommended to have the following capabilities:

- Microsoft Windows 2000, Windows XP, Windows 2003, or Macintosh OSX
- Microsoft Internet Explorer 6.0, SP 1
- A Windows Media Player 9
- A display resolution of 800 x 600 pixels or greater
- A Windows-compatible sound card
- A broadband internet connection (256 kilobits per second or greater)
Internet2, the technology used to broadcast the webcasts, is a high-speed, high-bandwidth, dedicated internet network developed in 1996 by leaders in the research and education community in the United States as a way to better support education and research collaborations worldwide. The typical bandwidth for standard internet conferencing is 384 kilobits per second, while Internet2 operates at 2 megabits per second. The higher bandwidth allows for better resolution and permits faculty at the CCGHE to utilise complex imaging techniques, such as manipulating 3-D magnetic resonance imaging (MRI) images.

Future Planning/Vision

CCGHE plans to develop more timely, relevant distance learning courses in the future targeting the specific needs of clinicians in the Democratic Republic of the Congo, Uganda, and Tanzania.

LEARNING FOR INTERNATIONAL NON-GOVERNMENTAL ORGANISATIONS (LINGOs)

Date Information Was Collected: August 2008

Data Sources for Summary:

- Review of website
- Presentation by LINGOs representative at I-TECH Headquarters, Seattle, United States, on August 28, 2008

Website: http://ngolearning.org/

Description of Programme Activities

LINGOs’ goal is to improve the performance, lower the cost, and increase the effectiveness of NGOs working in the humanitarian relief, development, and environmental sectors. Together, LINGOs member agencies provide humanitarian relief and development assistance in more than 125 countries. LINGOs believes that agencies and partners increase the impact of their work by sharing learning resources. Created in 2005 as a means for organisations to share learning resources, LINGOs has grown to include more than 35 organisations in 2008 and is continually expanding. It has served as a central point of contact for private organisations that are interested in assisting the sector but want to see their contributions of software, courseware, systems, and services leveraged across many organisations.

LINGOs member benefits include the following:

- Technical support from many e-learning professionals interested in giving their time and talents to international NGOs via the LINGOs Volunteer Programme
- Two user licenses for the Articulate E-Learning Development Tool
- Three user licenses for the Outstart Trainer E-Learning Development Tool
- Up to ten supervisor licenses for the Elluminate Academic Full Version, a tool that allows organisations to run live synchronous learning events with up to 25 attendees
- Unlimited access to the Mindleaders LINGOs curriculum, which includes more than 2,000 online courses in such areas as IT, management, and instructional design
- Unlimited access to the Ninth House Management training series
• Access to the Harvard Management Mentor course series at a reduced cost
• Access to the eCornell course series (8 weeks each) on a space-available basis (eCornell is established and wholly owned by Cornell University, and provides online learning experiences tailored for professional and executive development in the areas of strategy, leadership and management development, human resources, financial management, and hospitality management.)
• French- and English-language training CDs
• One premium membership in the eLearning Guild, a member-driven online information centre where those involved in the design, development, and management of web-based educational or instructional content (e-learning) can identify and access resources needed to ensure the success of their projects
• Member discounts on other LINGOs-negotiated conference fees, courses, etc.
• Access to the LINGOs Sharepoint site

There are two levels of membership costing USD 3,300 or 6,600 per year, respectively, plus a USD 1,000 initiation fee. Each level offers different benefits (for example, different numbers of licenses for software programmes).

Target Population

LINGOs membership is open to all international NGOs interested in improving learning and sharing experiences. Examples of organisations that belong to LINGOs include the Programme for Appropriate Technology in Health (PATH), CARE, the Academy for Educational Development (AED), the American Refugee Committee, Catholic Relief Services, Habitat for Humanity, Heifer International, the International Rescue Committee, Oxfam UK, the Population Council, and World Vision.

Advantages and Disadvantages

Michael Culligan, Director of Operations at LINGOs, spoke frankly with I-TECH about the advantages and disadvantages of Elluminate and Adobe Connect Pro Live for virtual online classroom environments. Both platforms show PowerPoint slides in a live classroom online and allow presenters and participants to transmit audio:

• Elluminate, in Culligan’s experience, works well at very low bandwidth.
• Elluminate has a feature by which remote sites that experience interruptions in the presentation can ‘catch up’. The system will start back up where the presentation left off, but in a fast forward mode that makes the voices sound high pitched and very fast. In this way, participants do not miss the content of the presentations.
• Elluminate requires a plug-in that users must download before using the system; this downloading must be done only once. Adobe runs on Flash-based technology already built into 98 per cent of computers. Downloading this plug-in causes problems for some users.
• Adobe Connect allows video to be transmitted.
• Adobe Connect has a more streamlined look than Elluminate, which looks ‘a little clunky’, according to Culligan.
MILDMAY CENTRE, UGANDA

Date Information Was Collected: July 2008

Data Source for Summary:
- One written questionnaire from a programme manager

Website: 
- General: http://www.mildmay.org/

Description of Programme Activities

Mildmay is an international HIV and AIDS charity specialising in care, training, and service development. It operates in Africa, India, and Eastern Europe.

Mildmay Centre Uganda, in conjunction with Manchester University in the United Kingdom, offers a modular diploma and degree in HIV programme management. This course is part of a bachelor of science degree programme titled Health Systems Approach to HIV and AIDS Care and Management. The course is funded by CDC and is run in both Uganda and Kenya, with students also coming from Tanzania. It began as a traditional classroom-based course, but has evolved to contain elements of distance learning because it is a programme strongly rooted in the workplaces of participants.

The distance learning component is still in the early stages of development. It involves using a virtual learning platform called Moodle that allows students to access the content taught during the face-to-face sessions, the week’s learning materials, resources for the class, and posted assignments. Students engage in asynchronous learning by posting to a discussion board on Moodle and using e-mail to communicate about course content with each other and tutors. Tutors and programme staff handle administrative tasks by using Moodle to track students’ records and participation in the course. The platform is also accessed by external course examiners in the UK.

For the face-to-face component, students attend 1–2 weeks of class at the start of each module. For the remainder of the module (about 2 months), students engage in self-study. During this time, tutors conduct one supervisory visit to each student’s workplace to mentor the student face-to-face; support is also provided to the student via telephone and e-mail. During the face-to-face sessions, the Mildmay Centre provides accommodations and catering services for students who are housed on site in addition to transport to/from Kenya via inter-country buses. The centre provides all materials used in the sessions, and there are libraries on site for internet access. No per diem is paid to students.

Currently the programme staff includes four Ugandans, three Kenyans, and two Britons. All staff members work full time, and some have participated in distance learning courses themselves.

Target Population

The target audience includes senior health care practitioners and HIV and AIDS service providers at the diploma level, including doctors, nurses, clinical officers, religious leaders, administrators, politicians, armed services personnel, teachers, and social workers. About 30 students are admitted in each cohort, and two cohorts usually participate concurrently. There is sometimes a third cohort that includes about 12 students.
Successes and Advantages

- The Moodle platform improves administrative efficiency. Keeping student records, transferring teaching materials to the internet, and tracking participation can be done quickly. In addition, Moodle is open-source software, so it can be used at no cost.

Challenges and Disadvantages

- Students have few IT skills, so interest in accessing a virtual website for learning purposes is limited.
- Access to personal computers is limited. Going to an internet café is less appealing to students than using a personal or work computer.
- Internet access is sometimes limited. At times, the website cannot be accessed because of server problems in particular areas.
- Tutors are not enthusiastic about using the virtual website because of poor internet connections and heavy workloads. Some believe it is demanding to update and post work online instead of using the traditional print-based methods.
- Putting all materials in electronic format is difficult. There are some textbooks and old handouts not available electronically that LINGOs would like to make available.
- Sometimes upgrades to Moodle that are intended to improve the site make it less effective.
- Interest in accessing the internet is low among the target audience. Thus, the programme has difficulty attracting potential students. Current students complain about the difficulty of accessing the internet. In fact, the programme is not marketed specifically as a distance learning programme for this reason.
- Some students lack typing skills, so they must pay for their assignments to be typed. One tutor noted that the programme requires more time to be built into the curriculum so students’ computer skills can be developed.
- Some students have dropped out of the course, but the reasons do not usually relate to the distance learning component. One reason is a change in jobs, when the new job does not allow the student to continue with the programme.
- Online interactivity is limited by students’ comfort level. Students hesitate to use the Moodle discussion board, perhaps because they are not used to and therefore are not comfortable with doing so.

Platforms/Media/Materials Used

As noted, the course uses blended learning. It includes 1–2 weeks of onsite classroom-based sessions, during which students access a library and print-based materials. During the distance component, students are based at their workplaces and use Moodle, which contains online resources for students, posted assignments, and a chat board.

Evaluation

An evaluation of the programme has not been conducted. Students are evaluated through assignments such as essays, projects, and in-person seminars; they provide feedback at the end of the face-to-face sessions. Students and tutors also meet one-on-one at the end of each module.
Future Planning/Vision

LINGOs would like to include a synchronous distance learning component in the programme, as well as improve use of the asynchronous component (Moodle).

MINDSET, SOUTH AFRICA

Date Information Was Collected: November 2008

Data Source for Summary:
- Review of website

Website: http://www.mindset.co.za/health/default.asp

Description of Programme Activities

Mindset Network is a non-profit South African organisation aimed at fostering the personal, social, and economic development of all people in Africa. Mindset creates, sources, and delivers quality educational resources on a mass scale through appropriate media. It equips schools and clinics with the infrastructure required to use these resources, such as PCs, video recorders, televisions, satellite dishes, and decoders. Mindset’s holistic training strategy is focused on equipping educators and HCWs with the knowledge and skills needed to use ICT and integrate these technologies into day-to-day practices.

Launched in 2003, Mindset Health is a partnership among Mindset Network; South Africa’s National Department of Health; and Sentech, an energy consulting company. Its aim is to improve health education and attention to critical health issues on a larger scale, including the HIV and AIDS epidemic. Mindset Health works with health care providers, HCWs, and the general public. Its projects are currently available on its website and are broadcast in South Africa to about 300 health sites, but the potential exists to reach the rest of Africa as well. Mindset Health has been identified as a strategic and effective resource for reaching a broad audience in rural and urban areas and improving the knowledge and skills of HCWs in managing HIV and AIDS–related conditions in South Africa. Current projects include those described below.

Mindset Health Channel

This pilot study broadcasts a satellite channel with information on HIV and AIDS to both patients and HCWs at health care facilities. It was implemented at 56 sites in all nine provinces of South Africa, including urban, peri-urban, and rural areas. In waiting rooms of health care facilities, patients can view up to 100 hours of content on HIV and AIDS and TB from appropriate media providers in the form of health news and reports, dramas, documentaries, public service announcements, and educational programming. HCWs are provided with televisions and desktop computers to view these materials and access information stored in the computers in video form.

Digital Health Education Content

Mindset Health sources and creates digital health education content that is available on its website. The material is delivered via video, multimedia computer lessons, and print media. It is also available in multiple languages, including isiZulu, isiXhosa, seSotho, English, and
Afrikaans. Initial materials have focused on HIV and AIDS and TB. Topics have included voluntary testing and counselling, community-based organisations, stop TB, and ART readiness.

Profiles

Video and print profiles of organisations and people affected by HIV and AIDS are intended to bring attention to people and organisations in South Africa that are increasing awareness of HIV and AIDS and providing support for people living with HIV and AIDS. Many of those involved in the profiles are living with HIV and AIDS themselves and have committed to telling their story to help others.

Target Population

Mindset Health targets health care providers, HCWs, and the general public.

Platforms/Media/Materials Used

Educational content is delivered through a variety of means, including video, the internet, multimedia computer lessons, print, and satellite broadcasts and datacasts.

Successes and Advantages

- Mindset programmes allow HIV and AIDS–related information to reach HCWs and patients throughout South Africa, and potentially throughout Africa. The Mindset Health Channel is available in 56 health facilities in every South African province, and digital health education content and both organisation and personal profiles are available at no cost on the Mindset Health website.
- Content is developed and recorded locally, making it more relevant and more credible to the target audience. In addition, content is available in several local languages, making it accessible to a broader audience. It is developed by experts, ensuring that it is accurate and up to date.
- Mindset has the support of the South African Department of Education, Department of Communication, and Department of Health. Its content is evaluated by government representatives to ensure that it is consistent with national goals and policies, including those related to e-learning and the national curriculum.

Challenges and Disadvantages

- The cost of providing technical equipment and hiring content experts could restrict the expansion of Mindset’s activities to other countries. Furthermore, South Africa has a more developed infrastructure to support ICT than other countries in sub-Saharan Africa. Also, Mindset enjoys the support of the South African government, and such support is difficult to predict in other countries.
- At this time, Mindset does not have copyright protection for any of its work. This ensures that its materials are widely available for use by communities, organisations, and individuals, but also presents the risk of third-party manipulation of the materials. For this reason, Mindset is seeking a Creative Commons License to prevent the unlawful or improper use of its materials.
Evaluation

According to a report co-authored by Vis Naidoo, CEO of Mindset Network, research found that the content produced by Mindset Health is stimulating, empowering, and at an appropriate level for its various target audiences. Audiences appreciate the availability of the materials in different languages. The report states that 58 per cent of HCWs who work in clinics where Mindset materials are available have accessed them, and that noise and traffic in waiting rooms and a lack of time for HCWs to use the materials are the most common constraints. However, almost all of the HCWs desire further training in HIV and AIDS–related topics. The authors believe it is important to give HCWs control over their own continuing education and that offering a ‘professional development, aligned programme for HCWs may address the issue of taking responsibility for learning’ (Greenop and Naidoo, 2008).

How Programmes Are Addressing HCW Shortages

Mindset Health enhances the knowledge of current HCWs and the general public, but it does not directly address the HCW shortage.

RESEAU EN AFRIQUE FRANCOPHONE POUR LA TELEMEDECINE (RAFT)

Date Information Was Collected: June 2008

Data Sources for Summary:

- Review of website
- Written questionnaire from one programme manager
- Journal article (Geissbuhlera et al., 2007)

Website: http://raft.hcuge.ch/

Description of Programme Activities

The core activity of RAFT is weekly webcasting of interactive courses targeted at physicians and other health professionals in 15 French-speaking African countries. The topics covered are proposed by the partners of the network and focus on knowledge sharing and dialog. Courses are webcast every week, available at no cost, and followed by hundreds of health professionals who can interact directly with the tutor; 70 per cent of the courses are now produced and webcast by experts in Africa. A bandwidth of 30 kilobits per second, the speed of a basic telephone modem, is sufficient, and enables participation from remote hospitals or even cybercafés. The project is a partnership among WHO, the Digital Solidarity Fund, the Université Francophone Numérique Mondiale, and the enLink Initiative.

Other activities of the RAFT network include videoconferences, teleconsultations based on the iPath system, collaborative knowledge base development, support for medical laboratory quality control, and evaluation of the use of telemedicine in rural areas (via satellite connections) in the context of multi-sectorial development. RAFT places a strong emphasis on capacity development of the countries involved for maintenance of the network.

Webcasts are coordinated locally by site coordinators, who are responsible for inviting participants and for preparing, distributing, and collecting materials. There are roughly 30 facilitators, some with previous training in distance learning. RAFT conducts training
Target Population

The target audience is HCWs in French-speaking West Africa, in particular those who are geographically isolated. Most are health care professionals, but there are also hospital administrators and public health professionals. The courses are open to anyone who would like to participate. A coordination team in each of the 15 countries ensures that as many professionals as possible know about the sessions. Each week between 300 and 800 people participate. Attendees are not monitored on a regular basis, but the number of participants is continually increasing. Neither participants nor site coordinators appear to have any problems with accessing or using technology. There is no face-to-face component, and participants receive no per diem.

Successes and Advantages

Since the programme’s inception in 2001, it has been working well. Evaluation results show that its goals are being met:

- The sessions enable remote support for HCWs in making better diagnostic and therapeutic decisions.
- The sessions also give HCWs access to distance continuing education that is adapted to their needs without requiring them to leave their workplace.
- The greatest advantage is that in isolated settings, there is no alternative means of accessing this information.
- Minimal equipment and staff resources are necessary to take part; all that is needed are internet connectivity, a laptop, a webcam, and one technical coordinator working part-time on this project (in each country). The cost is low: one laptop plus one webcam costs around USD 1 000; the cost of connectivity varies from USD 50 to USD 500 a month.
- The software and tools used are suitable for low-bandwidth environments. The sites have ground and satellite connectivity.

Challenges and Disadvantages

- There are infrastructure issues related to bandwidth. The network is working with telecommunications companies to address this problem and is also trying to develop very-low-bandwidth webcasting tools.
- Competencies for developing the content of the live sessions are lacking. To address this issue, local people are receiving the necessary training.
- The programme is not marketed well.
- Funding is a challenge.
- Building capacity so that management of the series can shift from north–south to south–south ‘takes a lot of energy and training’ according to the programme manager.
- Developing interactive sessions/discussions that are not simply didactic is a challenge.
Platforms/Media/Materials Used

Dudal is the platform developed for use in the series. It is specifically tuned to function over low-bandwidth connections (25 kilobits per second), thus enabling remote users to participate even from a cybercafé in a small town.

iPath is the software used for the teleconsultations. iPath allows virtual communities of experts to collaborate remotely to solve patient-specific problems, enabling participants to obtain diagnostic support; a second medical opinion; or help with evaluating, deciding on, and planning the medical evacuation of a patient. Application domains include radiology, dermatology, surgical follow-up, infectious disease, and others. Access to this tool is limited to users and experts identified by RAFT coordinators.

Future Planning/Vision

There are plans to deploy the network in smaller hospitals (district level) and expand to English- and Portuguese-speaking African countries.

UNIVERSITY OF SWAZILAND INSTITUTE OF DISTANCE EDUCATION (IDE)

Date Information Was Collected: August 2008

Data Source for Summary:
- Review of website

Website: www.uniswa.sz

Description of Programme Activities

The IDE’s mission is to create educational and training opportunities for individuals. To this end, the IDE aims to ‘take University education to the people rather than have the people come to the University’. The IDE offers a web-based approach to learning, and a website has been developed to improve communication with students. On this website, students can view their timetables and access course-related information, such as assignments, course outlines, handouts, and test schedules. The site provides a link to a notice board that displays important IDE announcements.

The distance learning courses include both face-to-face sessions and self-study modules. Attendance is compulsory for the face-to-face sessions, which consist of lecture hours, in which students meet with their course lecturers, and tutorial hours, in which they meet with their course tutors at the Regional Learning Centres (RLCs).
Target Population

Currently, the IDE offers six programmes:

- Certificate in French
- Diploma in Commerce
- Diploma in Law
- Bachelor of Arts (Humanities)
- Bachelor of Education (Adult Education)
- Bachelor of Commerce

Successes and Advantages

The IDE has a Learner Support Services Unit that continuously monitors the academic progress and attendance of students, and provides counselling to those students who appear to be experiencing difficulty and therefore are likely to drop out. This support has resulted in a marked decrease in the number of dropouts.

The IDE has established RLCs in strategic locations such as training centres, colleges, large schools, and regional educational centres. The criteria for establishment of the RLCs are (1) availability of basic infrastructure (e.g., electricity, water, rooms); (2) accessibility to the centre by public transport; (3) centrality of the location; and (4) the number of students that can be served. The RLCs are staffed by part-time coordinators and part-time course tutors.

The RLCs have (1) a workspace ("office") for a regional centre manager/coordinator, (2) an appropriate resource/reading room for students, (3) a classroom for face-to-face sessions, (4) a storeroom for learning materials and equipment, and (5) a resource room. Each RLC is equipped with a file cabinet to store learning support materials (e.g., course reading and reference materials), equipment and furniture (e.g., a VCR, audio cassette player, television set, computer), and various records (students' assignments and tests, and attendance records of tutors and students).

Challenges and Disadvantages

Swaziland scores low on the telecommunications infrastructure index—an international index consisting of a composite, weighted average of six indices that define a country's ICT infrastructure capacity: primary indicators are numbers of PCs, internet users, and mobile phones and size of the online population; secondary indicators are numbers of televisions and telephone lines. Other challenges faced by the IDE are high dropout rates and inadequate transportation facilities. Face-to-face interactions and academic counselling are often limited to on-campus students.

A final challenge is one associated with dual-mode institutions like the University of Swaziland: the working relationship between the distance learning units and the conventional departments, as well as the issue of parity of standards between the programmes and courses offered on- and off-campus.

Platforms/Media/Materials Used

The IDE makes use of websites and electronic materials in the form of CDs and DVDs.
How Programmes Are Addressing HCW Shortages

Swaziland, a developing country in the southeastern portion of the African continent, has only one university that cannot enrol all qualifying candidates for health care work. Its limited resources make open and distance learning the only path forward to educating the Swazis in HIV and AIDS. Although none of the IDE’s current programmes target HCWs, an effort is under way to use the IDE to spread awareness of HIV and AIDS and to discuss factors fuelling HIV infection in Swaziland. The IDE has the potential to offer programmes for HCWs in the future.

Future Planning/Vision

In the future, an online discussion forum will be added to the IDE website to enable students to hold discussions with each other and with their lecturers. The only way to improve the programme in the near future is to develop creative teaching strategies that can overcome infrastructural limitations.

VIDEOCONFERENCING AT THREE SOUTH AFRICAN UNIVERSITIES
(UNIVERSITY OF STELLENBOSCH, UNIVERSITY OF PRETORIA, AND UNIVERSITY OF FREESTATE)

Date of Site Visit: Not applicable

Data Source for Summary:


Description of Programme Activities

The Department of Radiology at the University of Pretoria is now fully equipped with state-of-the-art digital technology, and is in the process of developing a distance learning programme for the radiology department using videoconferencing. That this facility is now available and functioning is a result of the efforts of Dr. Otto Schulze and Professor Jan Lotz to link their institution with the University of Stellenbosch and the University of Freestate for videoconferencing on radiology. The programme will develop a national curriculum and conduct regular interactive discussions and lectures on radiology and other clinical topics.

Target Population

The target population is radiologists and other medical technicians at the three universities.

Successes and Advantages

After extensive planning, testing, and checking of equipment, the first interdepartmental videoconference took place among the University of Pretoria, University of Stellenbosch, and University of Freestate. The video link provided a high degree of clarity; the audiences in Bloemfontein and Pretoria could be seen and identified clearly. As might be expected, there were technical glitches, but overall the videoconference was a success, and the two sister departments appeared to enjoy and benefit from the professor’s presentation.
Challenges and Disadvantages

The challenges experienced during the first session were not unusual for an experiment with a new technology. They included too many PowerPoint slides, slides that were not well designed, and an inability to moderate properly.

Platforms/Media/Materials Used

Videoconferencing was the main platform used. PowerPoint slides were transmitted in advance of the session. Two-way conversations, along with the display of PowerPoint material, took place during the live session.

How the Programme Is Addressing HCW Shortages

The programme addresses the need to share expert information, thereby improving the care of patients.

Future Planning/Vision

The long-term ambition of the universities involved is to establish a national curriculum and to conduct regular instruction and interactive discussions. The success of this videoconference programme both technically and educationally is an important milestone and should pave the way for future multimedia transmissions and interaction among local and possibly international universities.
B.6 Review of Distance Learning Programmes in the I-TECH Network

This section summarises the review of distance learning programmes in the I-TECH network:

- I-TECH HIV/AIDS Clinical Seminar Series (page 272)
- I-TECH Botswana Monitoring and Evaluation Officer Mentoring Programme (District Level) (page 275)
- I-TECH Global Staff In-Service Series (page 276)
- I-TECH India: Clinical Consultation Warmline (page 278)
- I-TECH India: Monthly Listserv Updates on HIV and AIDS for Clinicians (page 279)
- I-TECH Namibia Digital Video Conferencing (DVC) Project (page 280)
- University of California, San Diego’s (UCSD) Clinical Case Teleconference with I-TECH Mentors: Eastern Cape, South Africa (page 284)
I-TECH HIV/AIDS CLINICAL SEMINAR SERIES

Date Information Was Collected: September 2008

Data Sources for Summary:
- Summary written by programme manager

Website: www.globalhivlearning.org

Description of Programme Activities

The I-TECH HIV/AIDS Clinical Seminar Series is a bi-monthly distance learning series aimed at HCWs treating HIV and AIDS in Africa, the Caribbean, and India. Experts on HIV and AIDS present on a variety of topics related to advanced care, comprehensive management, and treatment through live sessions across several countries around the globe. Live 60-minute sessions use a case-based format, and a listserv allows participants to engage in follow-up communication across sites after each session. Archived sessions are available for downloading from the website. Sessions are conducted in English.

Goals of the series are as follows:

- Improve care delivered by HCWs to patients with HIV and AIDS in resource-limited settings.
- Establish an international network of clinicians and HCWs in the field of HIV and AIDS who can work together through case discussions and lectures to address challenging issues.
- Promote collaboration and mutual understanding among a diverse network of clinicians.
- Deliver up-to-date and evidence-based information on prevention, care, and management of HIV and AIDS.

Each of the live (synchronous) sessions is presented via Adobe Connect Pro Live. The presenter presents a clinical case using PowerPoint slides that guide a lecture and discussion of the topic. Following the lecture, the presenter takes questions from participants via the chat function of Adobe Connect. An on-site facilitator types participants’ questions into a chat box that can be read by all participating sites and the presenter.

As part of the series, a Dermatology Forum is conducted quarterly in which participants submit case histories along with jpeg images. During the session these cases are reviewed by a dermatology expert.

A website provides the course schedule, additional resource materials for each session, an archive of each session that can be viewed via a streaming link, and a listserv through which participants may post additional questions or engage in asynchronous text discussion with the presenter after each session.

Target Population

The target population consists of clinicians (doctors, clinical officers, advanced nurses) treating patients with HIV and AIDS in resource-limited countries served by I-TECH and University of Washington–affiliated programmes. Currently there are more than 100 participants from more than 30 sites. Countries represented include Jamaica, the Bahamas,
Barbados, Trinidad and Tobago, St Kitts and Nevis, Haiti, Guyana, St Lucia, St Vincent and the Grenadines, Ethiopia, Tanzania, Lesotho, Mozambique, South Africa, Botswana, Namibia, Kenya, India, and Peru.

**Successes and Advantages**

- Site assessment tests are provided to participating sites to orient them to the Adobe Connect Pro Live platform and ensure that their settings and connections are sufficient for participation.
- Sessions are stand-alone and usually do not build on one another, making the series flexible and allowing participants to attend as they wish.
- Sites that cannot participate in the live sessions sometimes conduct a local session where participants watch the recorded session, and a local clinical facilitator discusses its application to the local context.
- Adobe Connect Pro Live allows for designing games. One session called HIV Game of Knowledge used a ‘Jeopardy’ platform for sites to compete against each other.
- Sites with very low bandwidth (36 kilobits per second modem) can participate.
- Two sessions included presenters from outside the United States (India and Barbados).
- Sessions are highly interactive, and each is case-based.
- Participants reported that the series is effective in updating their knowledge and that they can apply what they learn to their work.

**Challenges and Disadvantages**

- Viewing streaming links over low bandwidth is difficult. A solution has been to provide PowerPoint slides on CD-ROM for distribution.
- Power disruptions, mainly in Ethiopia, have prevented participation at times.
- The technical difficulty reported most often by sites is inadequate internet connectivity, which results in poor audio quality during the sessions.
- Another difficulty commonly reported by participants is difficulty in being able to read the slides because the text is too small.
- Some participants noted that the poor audio quality discouraged them from asking questions because they were not able to hear the responses and/or follow the presentation.
- Scheduling across ten time zones for the synchronous sessions is difficult. At least one site will always be unable to participate.
- Strong site coordination is necessary for local participation. If a local site coordinator is not able to market and coordinate a session and ensure that participants attend, site participation will be low.
- Because presenters are presenting only once in a year, it is difficult to develop a presentation that takes advantage of all the interactive features of Adobe Connect Pro Live (which would be difficult to teach them in the short amount of time they have to prepare).
- Often sites do not send cases unless they receive many reminders via e-mail.

**Platforms/Media/Materials Used**

Adobe Connect Pro Live software is used to present the sessions. Participants see a PowerPoint slide and a still image of the presenter. Video can be transmitted, but most sites
do not have enough bandwidth for this purpose. Some sites also have enough bandwidth to transmit audio, but use a chat function to communicate because of the limited time of a live session and the large number of participants attending each session. Adobe Connect Pro Live offers features, such as polling pods, that allow participants to select the answers they think are correct. Participant responses are automatically calculated. Files can also be sent through the platform. Other features include a whiteboard; screen sharing; insertion of text boxes and typing on the screen; and interaction via thumbs up, hand raising, and other icons. Use of these features varies depending on the comfort of presenters and the topic.

Evaluation

Site coordinators submit a session evaluation to the centralised programme coordinator after each session. At the end of the series, participants and site coordinators receive evaluation forms. At the end of the first, pilot year, an intensive evaluation was conducted. Participants and site coordinators gave feedback after each session. Programme coordinators were also interviewed, and two focus groups were conducted with six site coordinators by telephone.

The evaluation report noted that participants had gained knowledge and found the sessions useful for their work. Some sites had experienced technical difficulties, but these were usually not severe enough to halt their participation in the session. Adobe Connect Pro Live has been found to be useful even at very low bandwidths.

Lessons learned from the pilot year included the following:

- Case-based learning and interaction are effective approaches.
- Flexibility and backup strategies are necessary to troubleshoot internet connection issues.
- Strong, responsive central and local coordination is necessary.

Future Planning/Vision

The largely positive experience of the pilot year, coupled with feedback from participants requesting more sessions, has resulted in the scheduling of sessions twice monthly for 2008–2009.

Asynchronous access to sessions will continue to be provided through streaming links on the website and copies of sessions on CD-ROM to those who request them. In addition, an updated version of Adobe Connect Pro Live should facilitate saving the sessions in an electronic file format that can be downloaded and then viewed offline. Slides and handouts are now sent routinely 4–6 days before a session. Sites experiencing difficulty during sessions are re-assessed by the IT specialist.

When sessions were held at two different times, they tended not to be as well attended. Now, during the second year, the sessions are being presented at the same time to ensure broad participation.
I-TECH BOTSWANA MONITORING AND EVALUATION OFFICER MENTORING PROGRAMME (DISTRICT LEVEL)

Date Information Was Collected: May 2008

Data Source for Summary:

- Written questionnaire from one programme manager

Description of Programme Activities

This 3-year programme is still in the planning stages, although participants have been selected. The goal of the programme is to improve the use of data for HIV and AIDS policy and decision making through mentoring of 44 monitoring and evaluation officers serving at the district level. The programme combines national training, regional training, on-site mentoring, and self-study exercises to be completed by mail. Partners include the Botswana Ministry of Health, the Botswana Ministry of Local Government, BOTUSA (CDC in Botswana), the National AIDS Coordinating Agency (NACA), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the University of Botswana.

The programme will include ad hoc telephone calls as needed as a synchronous component. As part of a face-to-face component, a 2-week training orientation will be held at the beginning of the programme. The face-to-face session will allow monitoring and evaluation officers to interact, share their experiences, and learn from each other. The programme will be coordinated by I-TECH staff in country in partnership with the Botswana Ministry of Local Government. Participants receive per diem. I-TECH staff in Botswana and Seattle are developing the programme materials.

Target Population

The 44 monitoring and evaluation officers targeted by the programme were recruited and selected by the Ministry of Health. Most are recent graduates in social science.

Successes and Advantages

During a national training, all of the monitoring and evaluation officers received their own laptop computers because they are required for the programme. The potential advantage is the reduction in travel costs, as the monitoring and evaluation officers come from all of the districts of Botswana.

Challenges and Disadvantages

- A few officers have resigned their positions and thus dropped out of the programme.
- The coordination involved in distributing materials by mail may pose logistical challenges.
- Developing materials that are most helpful to the monitoring and evaluation officers in their current positions may prove to be challenging.
- Few monitoring and evaluation officers have consistent access to e-mail, which would be the preferred way to transmit assignments, rather than by post.
Platforms/Media/Materials Used

The materials have not yet been developed, but they will cover programme monitoring and evaluation; computer skills; and data collection, processing, and auditing. The programme will use telecommunications, ad hoc support by telephone as needed, and mailings by post.

Evaluation

The assignments sent by mail will be evaluated. The programme will be evaluated through phone calls, on-site visits, and feedback on the materials.

Future Planning/Vision

This programme will continue for 2 years, and may be expanded to other I-TECH sites.

I-TECH GLOBAL STAFF IN-SERVICE SERIES

Date Information Was Collected: November 2008

Data Sources for Summary:

- Attendance at sessions
- Results of session evaluations

Description of Programme Activities

Using the Adobe Connect Pro Live platform, presenters conduct sessions on a variety of professional development topics for staff across the I-TECH global network. The first pilot session was conducted on August 28, 2008, with 57 participants from more than ten countries. The second pilot session, which was the first session to include audio from one remote site, was held on October 30, 2008. The sessions include a live audience in Seattle in addition to a remote audience (sites around the globe) that is logged into a virtual classroom. Given the positive feedback on and effectiveness of the sessions, I-TECH hopes to scale them up in the coming months to include different teams and topics. Pilot sessions included didactic lecture with PowerPoint slides and interactive discussion, with the live audience asking questions through a microphone and the remote audience asking questions via the chat function (and a microphone for one site during the second pilot). The second session included group break-out discussions at the remote and live sites with a report back to the larger group. A virtual flip chart was also used to keep notes on key points and important discussions.

Target Population

I-TECH staff from across the global network and in Seattle are the target audience for these sessions in general. The pilots were conducted with the Training Development Team and were aimed at those working on the development of training programmes, curricula, and pre-service programmes. In the first session, country programme managers and monitoring and evaluation staff were also in attendance.
Successes and Advantages

- The advantages of using Adobe Connect Pro Live for this programme are similar to those of using it for the I-TECH HIV/AIDS Clinical Seminar Series, as enumerated above.
- The programme allows global I-TECH staff to learn, hold discussions, and share experiences despite being in ten different countries.
- Sessions are recorded, so anyone with an internet connection who was unable to attend a live session can view it at a later time.
- Most participants reported that the modality was effective and enjoyable. Some reported feeling they were part of a community.
- Many participants said that the modality allowed for professional development in all offices, not just headquarters, and both the live and remote audiences felt more connected to their colleagues across the global network.
- Few sites experienced technical difficulty, other than a power outage at one site.
- When audio was used by remote sites, the participants at those sites reported feeling more engaged than when using the chat function, and participants at remote sites that did not have audio said they liked being able to hear the audio of colleagues at other remote sites.
- Participants were enthusiastic about continuing with these kinds of sessions.
- The role of the moderator was critical to the success of the session. The moderator tracked the questions posed via the chat box and ensured that the presenter responded to them, communicated directly with remote sites to let them know their questions would be answered, and provided guidance to the presenter to ensure that time was allotted for discussion.

Challenges and Disadvantages

- In Seattle, a lack of dedicated laptops for distance learning means that issues pertaining to specific laptops arise shortly before the session.
- Many sites suggested that time should be allotted to receive questions and reactions from remote sites throughout the presentation. Some said they would like their questions in the chat box answered immediately to enhance their learning.
- Presenters noted that at times, it was difficult to multi-task among the chat box where remote sites were typing, the live audience, and the content being discussed.
- Some participants said that background noise at the Seattle site was distracting and that the microphone volume at the remote site was lower than in Seattle (the host site).
- The live audience thought the screen should be bigger so they could more easily read the chat box and slide text.

Platforms/Media/Materials Used

PowerPoint slides are presented over Adobe Connect Pro Live. Prior to the session, slides and additional resource materials or assignments are sent to participating sites via e-mail. A discussion notes pod (similar to a virtual flip chart) was used during the second session.

Evaluation

Following the session, evaluation forms were distributed and collected from all in-person participants in Seattle and e-mailed to all remote participants. Overall feedback on the
sessions was positive. The I-TECH distance learning team hopes to scale up the series to other teams and create a more systematic way of holding in-service training for global and Seattle staff.

Future Planning/Vision

Participants were enthusiastic about continuing the series and suggested a wide range of topics for future sessions. One suggestion was to include more practical, internally focused sessions to discuss how the Training Development Team applies theoretical learning to practical implementation and to share best practices and curriculum development techniques. Additional suggestions included using more innovative training techniques and incorporating culture into the training.

Other teams at I-TECH headquarters in Seattle have expressed interest in hosting in-service training with colleagues across the global network.

I-TECH INDIA: CLINICAL CONSULTATION WARMLINE

Date Information Was Collected: May 2008

Data Source for Summary:

- Written questionnaire from one programme manager

Description of Programme Activities

The I-TECH India Clinical Consultation Warmline is a phone line devoted to answering callers’ questions concerning HIV and ART, post-exposure prophylaxis (PEP), and perinatal care. The goal is to support clinicians across India in providing quality treatment and care for patients with HIV and AIDS. The warmline is in its first, pilot year, and if successful will continue next year.

Five clinicians rotate staffing the warmline phone. They have received no official training; however, a physician who runs a warmline at the University of California, San Francisco made a technical assistance visit to the I-TECH India office.

Target Population

This programme targets clinicians in India who treat patients with HIV and AIDS. An e-mail recruiting participants is sent to all those who have participated in the National AIDS Control Organisation’s ART training, as well as to partner organisations. There are also postings in e-forums, and an ad will appear soon in The Hindu, paid for by Tamil Nadu State AIDS Control Society.

Successes and Advantages

- The programme has a wide reach, providing clinicians anywhere in the country with immediate assistance in treating patients with HIV and AIDS.
- The warmline is particularly helpful to doctors who do not see many HIV cases but still need assistance.
- The start-up cost is relatively low; all that is needed is one cell phone and time from clinicians to staff the warmline.
Challenges and Disadvantages

- One logistical challenge is having clinicians available to take the calls. Clinicians have difficulty being able to devote their time to staffing the warmline.
- Clinicians who make the calls must pay for them, which sometimes makes the callers rush in describing a case. One potential solution to this problem is that the I-TECH clinician receiving the call could offer to call the caller back.
- There is only one phone line, so if it is busy, other callers cannot get through. I-TECH India is still piloting the programme; if it is successful, another line will be made available.

Platforms/Media/Materials Used

A mobile phone is used for the calls. If more detail is needed, follow-up is done through e-mail.

Evaluation

An evaluation of the pilot is in progress.

Future Planning/Vision

The goal is to reach many doctors throughout the country. The programme may be expanded to assist nurses as well. Following the pilot period, the feasibility of scale-up and continuation of the programme at I-TECH India will be assessed.

I-TECH INDIA: MONTHLY LISTSERV UPDATES ON HIV AND AIDS FOR CLINICIANS

Date Information Was Collected: May 2008

Data Source for Summary:

- Written questionnaire from one programme manager

Description of Programme Activities

I-TECH India uses a monthly listserv containing updates on topics related to HIV and AIDS for clinicians. This is considered a capacity-building activity as it targets and promotes ongoing interaction with graduates from the I-TECH India HIV Fellowship Programme and the programme’s mentors.

Content on the listserv includes clinical and programmatic updates on HIV and AIDS–related topics. At present, most of the updates come from the clinical updates on the I-TECH Clinical Team listserv.

Target Population

The target population includes current and former fellows of the I-TECH India HIV Fellowship Programme, I-TECH India clinicians, and mentors from the Government Hospital of Thoracic Medicine who work with the fellows.
Successes and Advantages

- The programme can reach a wide audience and provides for regular, ongoing communication among alumni of the fellowship programme.
- The programme is simple and low cost.

Challenges and Disadvantages

- Getting responses or feedback from the members of the listserv can be difficult.
- Selection of appropriate materials for posting on the listserv is important as too much traffic can cause people to ignore what is being sent.
- The large file size may be a challenge for participants sending documents as attachments. File-minimising programmes can be used to address this problem.
- Participants need to know how to use e-mail and the internet and download files.

I-TECH NAMIBIA DIGITAL VIDEO CONFERENCING (DVC) PROJECT

Date Information Was Collected: October 2008

Data Source for Summary:

- Written summary by programme manager

Website: In development

Description of Programme Activities

The Namibia DVC Project was developed to provide various cadres of HCWs who are geographically separated by large distances with the means to share and discuss common issues, solutions, guidelines, and approaches to alleviate the scourge of the HIV and AIDS pandemic through prevention, care, and treatment. Such a programme is especially important in a vast, under-populated country like Namibia where human resources to address the challenges of HIV and AIDS are scarce, and it is difficult and expensive for HCWs to travel to larger urban areas to receive training. Thus innovative and cost-effective methods are needed to deliver health information, training, supervision, field support, and related activities. I-TECH, with support and technical assistance from CDC and other partners, has been using DVC to meet these challenges. The DVC programme saves time and money and bridges distances to inform, train, and work with people in several remote locations simultaneously. DVC has provided opportunities to share and build on practical experience, allowing those who have been trained to give rapid feedback to trainers and to address local challenges by consulting with colleagues across the country. Benefits accrue from reduced costs for lodging, fuel, and travel, as well as the significant increase in numbers of people trained and updated on policy guidelines.

Goals of the programme are as follows:

- To use innovative and cost-effective technology to deliver health information within the Namibian context.
- To improve the capacity of local partners, such as the Ministry of Health and Social Services (MoHSS), to manage and use DVC technology to support and enhance
efforts to prevent HIV infections and provide services to those who are infected or affected by the pandemic.

- To pursue other innovative applications of DVC technology to address HIV-related problems, such as movie festivals featuring videos about various issues faced by people living with HIV and AIDS, distance learning projects that build skills in applying relevant medical procedures, and training in IT.
- To foster the use of videoconferencing in Namibia through participation in national working groups, the formation of working partnerships with organisations outside of the health community that are using DVC technology, and support for other organisations in the development of programmes and improved technical capability.

The topics addressed and training conducted with DVC include ART, paediatric ART, prevention of mother-to-child transmission of HIV, voluntary counselling and testing, opportunistic infections, TB, and nutrition and social issues related to HIV and AIDS. Since the programme was launched in 2004, 125 sessions have been held, with a total of 5 869 participants.

The DVC project is based on a national Integrated Services Digital Network (ISDN) network maintained by the parastatal Namibia Telecom. There are currently 12 active sites across Namibia. Six of these sites are based at Health Training Centres (Windhoek, Keemanshoop, Otjiwarongo, Oshakati, Rundu, and Engela), one at the directorate of Special Programmes/MoHSS (Windhoek), two at hospitals in Katima Mulilo and Opuwo, one recently set up at the MoHSS Regional Directorate office in Swakopmund, one in Luderitz Hospital, and one established at the I-TECH office as a testing site. Two new sites are imminent at the Grootfontein Hospital and the Onanjokwe Training College for Nurses.

To ensure sustainability and national capacity building, the DVC network is managed largely by Namibians. The DVC team is managed by the I-TECH DVC manager, who liaises with the head of information services at the National Health Training Centre, as well as with resource centre assistants at regional sites. The programme is supported by a DVC programme advisor. Technical support is provided by I-TECH DVC technicians.

**Target Population**

The target population includes clinicians (doctors, clinical officers, advanced nurses), social workers, testing counsellors, nutritionists, and other HCWs. In addition, the programme targets students in both pre-service and in-service programmes through the National Health Training Centre to provide DVC-based lessons to other members of the Health Training Network.

**Successes and Advantages**

- The programme has been a successful collaboration among many partners, including the MoHSS, CDC, I-TECH, the Peace Corps, and several Namibian DVC implementers.
- More than 5 000 people have attended more than 125 conferences.
- The network is expanding to 14 sites and will soon cover every region in Namibia.
- The programme is largely under the ownership of Namibians.
- It is a cost-effective way of delivering information.
- It is a good way to provide follow-up to site visits after training.
- It has proven to be a good method for supporting a variety of applications, including conferencing, distance learning, job interviews, and business meetings.
• One innovative use of the DVC has been a film festival highlighting the issues faced by people living with HIV and AIDS.

**Challenges and Disadvantages**

• Frequent ISDN network outages have affected connections to some of the sites. The plan is to transition soon to ADSL, which will allow use of IP (the internet) for videoconferencing.
• Power disruptions have occurred in some places during the rainy season, when violent electrical storms are common.
• The technical difficulty reported most often is sound problems due to noise in the ISDN copper wire lines.
• Another technical difficulty commonly reported is not being able to read the slides because of small text.
• Coordinating and moderating a multi-point conference can be challenging and require protocols and adherence to guidelines for successful conferencing.
• Strong site coordination is necessary for local participation.
• Not every speaker is effective. Many presenters need training in how to speak, act, and prepare materials before they can use the system effectively.
• Logistics is a huge problem. The procurement of new equipment, the replacement of faulty equipment, and other logistical support take months, not weeks.

**Platforms/Media/Materials Used**

Three different camera systems (models) are used. The newest and most flexible is the Polycom VSX7000S. A total of seven of these systems are installed at all of the training centres, as well as the I-TECH Office and Directorate of Special Programmes at the MoHSS. The older Polycom SP 128 camera systems are available elsewhere. Only the site at Opuwo makes use of an older but more powerful Polycom EX camera system. The VSX7000S’s use the VSX Visual Concert, which allows participants to project any material on a laptop screen through the camera system and the network. Each system is augmented by either a conventional TV monitor or an LCD screen. Other peripheral devices, such as combination VCR/DVD player/recorders, are included at the main Windhoek site. This site frequently hosts conferences and plays either videotapes or cassettes for presentations and records sessions. In large rooms, an LCD projector can be attached to the camera system to project the proceedings onto a large screen.

**Evaluation**

Each resource assistant at every participating site is required to submit a DVC event evaluation report after each assembly to the DVC manager at I-TECH. This information is extracted from the reports and recorded in a monitoring and evaluation database developed with Microsoft Access to record key observations made by the resource centre assistant (camera operator).

Lessons learned since the inception of the programme include the following:

• A new supply chain for equipment is needed that circumvents suppliers in southern Africa. It would be better to rely on parent organisations in both Atlanta (CDC) and Seattle (I-TECH) to provide a speedy procurement cycle with appropriate logistical support.
- A strong moderator following strict protocols is needed to maintain order and coherence when many sites are involved in a conference.
- Materials for presentation should be prepared at least 1 week in advance of the conference for redaction and distribution to regional sites.
- Many camera techniques used in commercial broadcasting have been adopted (mainly through a trial-and-error process) to, for example, keep the focus on people who are speaking.
- Central coordination is crucial to the organisation of nationwide conferencing.
- Conferences should be interactive. No more than five or six PowerPoint slides should be shown without a pause so questions can be asked.
- A successful conference usually runs out of time because interested participants ask many questions. A failed conference ends ahead of time, with few or no questions raised.

**Future Planning/Vision**

There are plans to develop a website to coordinate and control DVC conferences. Once it has been implemented, the DVC manager will no longer have to fax or mail materials in advance of conferences; rather, these materials can be downloaded. Other instructions, announcements, and news can also be made available.

The programme will be experimenting with a new ADSL network that has recently been made available in Namibia and promises ready access to the internet. Use of IP addressing will make it possible to reach any place in the world where a DVC system is located on the internet. This capability will provide at least two advantages. First, there is no extra cost for using the internet in this way as there is with increased use of ISDN communications. Second, no landing rights are needed for international calls if the internet is used, as would be the case if ISDN communications were used. Before a country can communicate with another country through ISDN communications, a formal agreement must be in place, or the country without landing rights must go through a country that has such an agreement. This is unnecessary if the internet is used.

**Expansion into Distance Learning**

The programme has taken steps to venture into distance learning with the presentation of training modules involving Microsoft Office products. These tentative first steps to develop skills instead of just providing information have proven promising. While the effort is beginning with IT topics, the experience gained should also apply to skill development in a range of areas, including those involving medical procedures.
UNIVERSITY OF CALIFORNIA, SAN DIEGO’S (UCSD) CLINICAL CASE TELECONFERENCE WITH I-TECH MENTORS: EASTERN CAPE, SOUTH AFRICA

Date Information Was Collected: May 2008

Data Sources for Summary:

- Written questionnaire from one programme manager
- Written questionnaire from one tutor
- Observation of one session

Website: None

Description of Programme Activities

UCSD conducts a live weekly teleconference in Eastern Cape, South Africa, hosted by its I-TECH mentors. The platform used is Adobe Connect Pro Live. The teleconference involves a review of patient cases by I-TECH mentor(s), as well as open discussion with health care providers from South Africa, Peru, Mexico, and the United States. The audience includes experienced and future mentors. The goals of the teleconference are to:

- Share teaching points from pertinent South African cases seen during the week.
- Stimulate clinical discussion among providers from various backgrounds and countries.
- Educate current and future mentors about patient cases and management in South Africa.
- Support South African HCWs through opportunities to share and discuss patient care issues.

The teleconference also serves to increase the familiarity of U.S.-based physicians with some of the common clinical problems that exist in South Africa. This greater familiarity helps future mentors assimilate into the medical environment before actually travelling to South Africa for their work as mentors so their time in South Africa is optimised.

There are two to three tutors presenting at one time, some of whom received training in distance learning. The lead clinical mentor and the training and evaluation manager provide training to others.

Target Population

The target population for the teleconference is HCWs in South Africa, past and future clinical mentors, medical residents and fellows, and other interested HCWs. The audience tends to include South African physicians caring for patients with HIV and AIDS and medical providers (physicians, nurses, students, pharmacists) at UCSD who deal with HIV and AIDS. Typically, sessions are attended by 6–20 participants a week.

The teleconference is generally advertised by word of mouth. Mentors invite South African HCWs with whom they come in contact to participate. Additionally, UCSD providers invite medical residents and fellows to participate as a means for further training.
### Successes and Advantages

- Sharing of clinical information across various nations (United States, South Africa, Peru, and Mexico) allows mentors to learn about the outcomes of the recommendations they provided.
- Future mentors are oriented as to the types of cases they may encounter.
- The programme allows for real-time discussion across the globe. South African providers can ask questions and receive immediate consultation.
- Participants share their approaches and experiences in their respective countries.
- The programme extends training and learning to many people across the globe simultaneously and creates networking opportunities for participants.
- Bonds are created between South African physicians and UCSD mentors.
- The teleconference is highly interactive (possibly because of the small number of attendees [six] for the session observed).

### Challenges and Disadvantages

- Internet access is unreliable in certain areas of South Africa. Some South African HCWs lack ready access to the internet or a computer. Participants and programme coordinators found that audio is not reliable in Adobe Connect Pro Live, which caused some sessions to end prematurely. As a solution, they began using Skype for audio. During the observed session with six participants, background noise from six Skype callers proved distracting. Information recently obtained indicates that these audio issues have been resolved, and audio is now being used over the Adobe Connect Pro Live platform. Follow-up inquiries revealed that the audio capabilities are being used through Adobe Connect Pro Live now (and not Skype).
- Finding an appropriate room with a computer and a large enough screen for the session is challenging. There is no dedicated room for the programme. Currently, someone’s office with an extra computer is being borrowed.

### Platforms/Media/Materials Used

The weekly clinical case conference is broadcast from East London, South Africa. Asynchronous activities occur if the conference presenter sends reading materials to participants. There is no face-to-face component. Synchronous activities include a live PowerPoint presentation via Adobe Connect Pro Live, and those with a login/password may review archived PowerPoint presentations saved as a streaming link within Adobe Connect Pro Live.

PowerPoint presentations are developed by mentors hosting from South Africa. The content is determined by the presenter. Usually the presenter is a U.S. physician or other health care provider spending time as a mentor in South Africa. The presenter selects an interesting clinical case from among those seen with other South African physicians in the preceding weeks. The presenter researches information on teaching points of the case and adapts the case and these points to a PowerPoint format.

### Evaluation

No formal evaluation of the programme has yet been conducted. UCSD is still working with mentors on technological and logistical issues. Tutors can provide feedback during the
teleconference and via Skype and e-mail. If there are problems or suggestions for improvement, these are typically discussed via e-mail.

**Future Planning/Vision**

In the immediate future, UCSD is focusing on fine-tuning the programme, but eventually it plans to include more South African HCWs, especially in remote areas. UCSD also would like to include participants from other training programmes, as well as sub-specialists who could further enhance the discussion in their areas of expertise. Potential enhancements also include incorporating test questions and evaluations into the PowerPoint presentations.
Appendix C
Glossary of Terms
**Adobe Connect Pro Live**: Software used for online collaborative meetings, presentations, training materials, web conferencing, learning modules via a virtual classroom, and user desktop sharing. Sessions conducted through Adobe Connect Pro Live can be archived for future viewing in asynchronous mode. The software is based on Adobe Flash Player. The platform allows the user to design the interface using ‘pods’ that perform a specific function (e.g., interactive chat, a whiteboard, a slide set, or an image). Interaction takes place by chat, voice, and use of images. For more information, visit <http://tryit.adobe.com/us/connectpro/webconference/?sdid=DJZHD>.

**Analog communication**: Transmission of information through a continuous signal. Examples include television and radio signals and most telephone lines.

**Articulate**: Software that allows one to add video, audio, and interactive features to PowerPoint slides for self-study modules that can be copied to a CD-ROM or downloaded from a website. It can be used in either an online or offline environment. For more information, visit <http://www.articulate.com/>.

**Asymmetric digital subscriber line (ADSL)**: Technology for transmitting digital information on phone lines that allows for simultaneous transmission of telephone services and data, using most of the line to transmit information to the user rather than to receive information from the user.

**Asynchronous (not live)**: A type of two-way communication that occurs with a time delay (does not take place simultaneously), allowing participants to respond at their own convenience.

**Bandwidth**: Maximum frequency for transmission of a communication signal with minimal distortion.

**Blended or hybrid learning**: Involves some mix of learners and tutors meeting face-to-face (usually at the beginning and end of a module) and distance activities using various pedagogical styles. Most distance learning programmes involving clinical education are structured as blended learning, as practical/hands-on learning is required.

**Centra 7**: A web-based software application that enables real-time enterprise communication, collaboration, and learning. The software can be used for web-based seminars, for meetings, and as a virtual classroom through any web browser. It enables real-time activity, as well as playback. For more information, visit <http://www.saba.com/products/centra/>.

**Chat room**: A designated place online where users can have text-based conversations in real time. Users can participate in a conversation or read along as others converse.

**Codian**: A manufacturer of high-performance videoconferencing infrastructure and part of TANDBERG, a global provider of telepresence, high-definition videoconferencing and mobile video. For more information, visit <http://www.codian.com/>.

**Computer-based training/learning**: Involves interaction between student and computer, usually individualised. Methods include drills plus tutorials, microworlds, and simulations. Can be delivered via the internet or offline (e.g., on a CD-ROM).
Continuing education or continuing professional development: Training of health care workers to update their knowledge and skills on specific topics, usually through short courses, workshops, and seminars.

Discussion board/chat board/posting platform: A forum on the internet for the discussion of a specific topic or set of related topics. Users generally post text asynchronously (not in real time). Discussions are archived by theme.

Distance learning: Often synonymous with distance education, can be defined as learning in which tutor and learner(s) are in physically separate locations. It can be either synchronous (live, meaning interaction takes place simultaneously, as in videoconferencing) or asynchronous (not live, meaning interaction takes place at different times, as in posting on an internet discussion board or e-mail). Distance learning uses a variety of media, including print, computers, mobile phones, and personal digital assistants (PDAs). Distance learning can encompass e-learning as well.

E-collaboration: Working together using electronic means. Collaboration among people or organisations is enabled by electronic technologies such as the internet, videoconferencing, and wireless devices.

EEDO: Software that provides learning and knowledge systems for e-learning. It allows users to create, capture, manage, expose, and transfer their knowledge and resources. It includes various programmes for indexing information, synchronising online/offline data, and creating simulations. For more information, visit <http://www.eedo.com/index2.html>.

E-learning: Learning that takes place primarily using an electronic format (most commonly computer-based training), which may or may not involve the internet. Other electronic delivery methods include CD-ROMs, videoconferencing, websites, and e-mail.

Elluminate: Software for live web conferencing and e-learning. One product commonly used in synchronous distance learning is Elluminate Live. This software allows interaction (voice, images, chat) through a virtual classroom and can be used by academic or corporate institutions for online meetings, training, or collaboration. Elluminate products are written in Java. For more information, visit <http://www.elluminate.com/>.

EpiSurveyor: A free, open-source software tool enabling anyone to easily create a hand-held data entry form, collect data on a mobile device, and transfer the data back to a desktop or laptop for analysis without expensive consultants, software subscriptions, or long-term contracts. For more information, visit <http://www.datadyne.org/?q=episurveyor/home>.

General packet radio services (GPRS): Communication service with higher data rates that allow users to participate in videoconferences and interact with websites using hand-held devices or laptops.

Information and communication technology (ICT): A broad term that encompasses all technologies for the manipulation and communication of information, including technology used for distance learning. ICT is sometimes considered synonymous with information technology (IT). It includes any medium used to record information (e.g., CD-ROM, video, DVD, memory stick, and printed material); technology for broadcasting information (e.g.,
radio and television); and technology for communicating through voice and sound or images (e.g., microphone, camera, loudspeaker, telephone, and cellular phone), computing hardware (e.g., PCs, servers, mainframes, and networked storage), personal hardware (e.g., mobile phones, personal devices, MP3 players, and software [including online software]), and the internet.

**In-service training:** Upgrading of health care workers’ professional qualifications through a residential or distance learning programme, resulting in a certificate, diploma, or degree.

**Internet2:** A high-speed, high-bandwidth, dedicated internet network developed in 1996 by leaders in the research and education community in the United States as a way to better support education and research collaborations worldwide. For more information, visit <http://www.internet2.edu/>.

**Internet-based learning:** Synonymous with online learning. The technology used is based on the internet.


**Integrated Services Digital Network (ISDN):** A digital network with higher speed than a regular telephone network. ISDN uses existing phone lines but requires specialised equipment. This type of network can easily send voice, data, and video over the same line simultaneously.

**Internet Protocol (IP) address:** A unique number identifying a device participating in a computer network that uses IP for communication.

**Local area network (LAN):** A communications network connecting computers by wire, cable, or fibre optic link. Typically a LAN connects parts of an organisation in proximity. Users can share software, hardware, and data.

**Moodle:** Open-source software designed to help educators create an online virtual community with rich interaction. It includes a learning management system for tracking student interaction and progress. Students and tutors can post comments, assignments, or images. For more information, visit <http://moodle.org/>.

**National Council for Technical Education (NACTE):** Oversees, registers, and accredits all technical training institutions in Tanzania. It approves all programmes for health care workers and is an important component in the development of any national upgrade programme in Tanzania.

**Online learning:** Any learning experience or environment that relies on the internet/World Wide Web as the primary delivery mode for communication and presentation.

**OpenROSA consortium:** Exists to reduce duplication of effort among the many groups working on mobile data collection systems. Its goal is to foster open-source, standards-based tools for mobile data collection, aggregation, analysis, and reporting. For more information, visit <http://www.openrosa.org/>.
Open-source software: Free software whose underlying code can be viewed and/or modified by the general public.

OutStart: Software that powers formal and on-demand learning, knowledge sharing, and community/expert collaboration that enable knowledge workers—employees, partners, and customers—to perform their roles far more efficiently and effectively. For more information, visit <http://www.outstart.com/>.

Pendragon: Allows one to create custom data collection applications for Palm-powered hand-held devices and PCs. For more information, visit <http://www.pendragonsoftware.com/>.

Personal digital assistant (PDA): A handheld computer for managing contacts, appointments, and tasks.

Preceptor: An expert or specialist, such as a physician or nurse, who provides practical experience and training for a student, especially in clinical training programmes. In distance learning programmes, preceptors guide students through the practicum or clinical portion of their studies.

Pre-service training: Generally defined as instruction that takes place before a person begins a job. It involves use of a formal training curriculum that leads to a professional qualification, such as a certificate, diploma, or degree. Pre-service training is usually long term—lasting from 1 to 6 years—and results in the training of new medical doctors, nurses, clinical officers, pharmacists, and other health care professionals.

Private automatic branch exchange (PABX): A telephone system within a private enterprise that does not require a live operator.

Short message service (SMS): Transmission of short text messages to/from a mobile phone, fax machine, or Internet Protocol address using an SMS centre.

Skype: Software that allows users to make telephone calls over the internet. Calls to other users of the service and to free-of-charge numbers are free, while calls to other landlines and mobile phones can be made for a fee. Additional features include instant messaging, file transfer, and videoconferencing. For more information, visit <http://www.skype.com/>.

Synchronous (live): Two-way live communication occurring in different places but at the same time, with virtually no time delay, allowing participants to respond in real time.

Teleconsult: Discussion of the diagnosis, prognosis, and/or treatment of a particular case using electronic information and technology.

Telemedicine: The delivery of health care from a distance using electronic technology such as computers, cameras, videoconferencing, the internet, satellite, and wireless devices.
**Tutor**: An educator who assists one or more students in achieving educational objectives. In distance learning programmes, tutors teach students mainly theoretical portions of the programme and work with preceptors to ensure that students achieve programme competencies. Also known as an instructor, teacher, or professor.

**Upgrade programme**: In Tanzania, synonymous with in-service training. It refers to upgrading of health care workers’ professional qualifications through a residential or distance learning programme that results in a certificate, diploma, or degree.

**Very small aperture terminal (VSAT)**: A communication system requiring the use of a satellite and computer to transmit data, voice, and video signals.

**Videoconferencing**: Interaction among individuals in different locations through video technology. Communication involves two-way audio with one-way or two-way video.

**Virtual learning**: A term frequently used interchangeably with distance learning, online learning, e-learning, or web-based learning.

**Virtual workspace**: A communications package that allows users to collaborate online (e.g., sharing files and applications, using an online whiteboard, and communicating via chat or instant messaging).

**Web-based learning**: A learning experience that utilises the World Wide Web.

**Webcasting**: Communicating to multiple computers at the same time over the internet by streaming live audio and/or live video.

**Webconferencing**: Videoconferencing that uses the internet and allows for the transfer of files, sharing of applications, and collaborative web browsing.

**Webinar**: A presentation, lecture, workshop, or seminar that is transmitted over the internet.