
Strengthening Comprehensive HIV/AIDS Care and Treatment for Pre-service Medical Education in Tanzania

Needs Assessment Report



The ACCESS Program is a five-year Leader with Associates cooperative agreement sponsored by the U.S. Agency for International Development (USAID). This global program aims to improve the health of mothers and their newborns through the use of key maternal and neonatal health (MNH) services. The ACCESS Program is implemented by Jhpiego in partnership with Save the Children, Constella Futures, the Academy for Educational Development, the American College of Nurse-Midwives and Interchurch Medical Assistance.

ACCESS works with USAID missions, governments, nongovernmental organizations (NGOs), local communities and partner agencies in more than 20 developing countries, and seeks to achieve large-scale advances by expanding coverage, access and use of MNH services and through improving household health behaviors and practices.

For more information about ACCESS, please visit www.accesstohealth.org, or contact Nancy Caiola, ACCESS Program Director, at ncaiola@jhpiego.net.

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal care
ART	Antiretroviral treatment
CAT	Continuous Assessment Test
FGD	Focus group discussion
HMIS	Health management information system
HIV	Human Immunodeficiency Virus
HKMU	Hubert Kairuki Memorial University
IMTU	International Medical and Technological University
I-TECH	International Training & Education Center for Health
KCM College	Kilimanjaro Christian Medical College
M&E	Monitoring and evaluation
MCQ	Multiple choice questions
MNH	Maternal and neonatal health
MOHSW	Ministry of Health and Social Welfare
MUHAS	Muhimbili University of Health and Allied Sciences
NACP	National AIDS Control Programme
NGO	Nongovernmental organization
NIMR	National Institute for Medical Research
OSCE	Observed Structured Clinical Examination
OI	Opportunistic infection
PITC	Provider-initiated testing and counseling
PLWHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission of HIV
PSE	Pre-service education
RCHS	Reproductive and Child Health Section
SBM-R	Standards-based management and recognition
STI	Sexually transmitted infection
TB	Tuberculosis
THANE	Tanzania HIV/AIDS Nursing Education [Project]
USAID	United States Agency for International Development
WHO	World Health Organization
WBUCHS	Weill Bugando University College of Health Sciences

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- Dr. Monica Chiduo, Lecturer, HKMU
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EXECUTIVE SUMMARY

National medical teaching institutions play a critical role in the training and development of new health workers. In Tanzania, this role is especially vital as medical institutions and physicians hold a great deal of influence. To this end, it is critical that such institutions support high-quality care for HIV/AIDS and teach core competencies as defined by Tanzania's national policies and guidelines on HIV/AIDS.

This needs assessment on HIV/AIDS in pre-service medical education was conducted in collaboration with Tanzania's five medical schools: Muhimbili University of Health and Allied Sciences (MUHAS); Kilimanjaro Christian Medical College (KCM College); Weill Bugando University College of Health Sciences (WBUCHS); Hubert Kairuki Memorial University (HKMU); and International Medical and Technical University (IMTU). Specifically, this assessment, which was conducted in July 2009, looked at teaching methodologies, resources for teaching, HIV/AIDS core content areas, and student and faculty experiences with the learning and teaching of HIV/AIDS, respectively.

KEY FINDINGS

Use of the *Tanzania National Guidelines for the Management of HIV/AIDS* was mixed. While 82% of faculty indicated that they use the *Tanzania National Guidelines for the Management of HIV/AIDS* as a reference, 48% of students felt that accessibility to the *Guidelines* as a resource was poor. And many skills and knowledge domains that are part of the *Guidelines* were not covered in curricula, according to the mapping exercise conducted with heads of department.

Students:

- For many of the core competencies that a student would find necessary for provision of HIV/AIDS services, more than 10% of students reported low or very low confidence. For counseling for antiretroviral treatment (ART) failure, for example, a full 26% of students were not confident in managing. While for compliance and adherence to ART, 19% of students indicated that they were not confident in providing this service.
- A high level of fear was noted among students on contracting HIV in the clinical setting: 64% of students reported a fear of contracting HIV from patients.

Academic staff:

- Overall, only one-third of academic staff has had in-service training on HIV/AIDS-related topics, indicating a lack of updated information on HIV/AIDS. Some of the technical areas with the biggest gaps between the number of people teaching a topic and the number who received training in that topic include: basic science of HIV/AIDS, clinical manifestations of HIV/AIDS, management of opportunistic infections (OIs) and management of sexually transmitted infections (STIs).
- Only 32% of academic staff have received training in effective teaching skills. This is reflected in a heavy reliance on lectures and seminars, with less than half conducting bedside teaching and very few using role plays or demonstrations.

RECOMMENDATIONS

Recommendations based on these findings include:

- Curricula need to be standardized and strengthened, while being tied to the core competencies outlined in the *Tanzania National Guidelines for the Management of HIV/AIDS*.
- Teaching around HIV transmission and infection prevention must be stressed.
- In-service training for academic staff and faculty in HIV/AIDS core competencies needs to be expanded.
- Effective training skills programs should be provided to academic staff, along with follow-up support and supervision.
- Skills labs need to be introduced in schools, along with the orientation of both faculty and students on how they can best improve learning.
- A thorough review of the assessment methodologies of the five medical schools should be conducted.
- Access to and availability of the *Tanzania National Guidelines for the Management of HIV/AIDS* must be improved for both students and faculty.

I. INTRODUCTION

BACKGROUND

National medical institutions and university teaching hospitals play a critical role in the training and development of new health workers. Such sites are often used for the clinical training of a variety of health worker cadres, not just medical students (e.g., nurses, midwives and paramedical technicians). For example, in Tanzania, medical schools' clinical practice sites support the clinical practicum of many other cadres. Furthermore, medical institutions and physicians hold a great deal of influence in Tanzania's health care system, from policy to practice. To this end, it is critical that such institutions and their personnel exhibit and support evidence-based, high-quality care for HIV/AIDS as a model for the entire country.

The joint WHO/Global Health Workforce Alliance task force for scaling up education and training for health workers (2008) identified the expansion of pre-service education and training programs as a critical success factor for increasing the number health workers within low-resource countries as well as the quality of care. The Government of Tanzania's *Human Resources for Health Strategic Plan* (2008) also recognizes the need for improved and expanded pre-service training, particularly with regard to HIV/AIDS.

The general consensus in literature on pre-service education is that it is easier to design a free-standing training course for in-service practitioners than it is to develop a curriculum for incorporation with an already-established system of medical education. As a result, in-service training has been the most commonly employed means of providing professional updates to health service personnel. While in-service training may be easier to develop and implement, however, it also requires removing medical personnel in practice from normal duties during training (Tanzania MMAM 2007). This is clearly problematic in Tanzania—a country that already faces a severe shortage of health workers—and points to the need for emphasis on pre-service training. There is also a clear economic benefit to incorporating revisions with the existing pre-service medical curriculum rather than paying for costly in-service training later on.

Changes in pre-service medical education in the developing world sometimes take the form of total curricular reform, as opposed to the reform of specific curricular elements, such as HIV/AIDS care and treatment. This total reform may take place when there is a transition from lecture-based teaching to student-centered, problem-oriented medical training, for which there is strong evidence of student competency and subsequent physician competency (Koh et al. 2008). Although transitioning to a more student-centered approach is important, revision of curriculum should occur in tandem with content technical updates, and should be linked to international pre-service standards set by the World Federation of Medical Education (2003).

In Tanzania, HIV/AIDS has been better addressed in improvements in nursing (and other cadre) education than in medical education. Tanzania is not alone in this disparity—in many countries, pre-service training on HIV/AIDS in low-income countries has been geared toward nursing students (Renggli et al. 2008; Knebel et al. 2008). In Mozambique, mid-level providers are being trained to roll out HIV/AIDS care and treatment services that were previously performed by doctors (Renggli et al. 2008). This task-shifting is at least partly due to chronic health worker shortages, which have necessitated the transition of responsibilities that may have traditionally

been part of a higher cadre's scope of work to nurses and other health worker cadres (Kober and Van Damme 2005). The Tanzania HIV/AIDS Nursing Education (THANE) Project worked to create 12 new curriculum modules to aid nurse educators in building the capacity of Tanzanian nursing schools to provide comprehensive HIV/AIDS education (Kohi et al. 2009). Also, I-TECH in Tanzania has been working to improve how HIV/AIDS is addressed in the pre-service education of lab technicians and clinical officers.

Task-shifting to nurses is a crucial strategy in coping with a health worker shortage. However, strengthening of medical education is also key and must be addressed. Medical doctors in Tanzania act as professional gatekeepers to many policy, public health, research and clinical interventions and reforms. Furthermore, it is important that they have the necessary skills to provide high-quality care for HIV/AIDS and related illnesses, whether in the referral function or the primary care function.

ACCESS' PRE-SERVICE HIV MEDICAL EDUCATION PROGRAM

ACCESS is a USAID-funded flagship program to improve access to high-quality health care. It is led by Jhpiego, an affiliate of The Johns Hopkins University. ACCESS has been working in Tanzania since 2004, supporting the Ministry of Health and Social Welfare (MOHSW) to improve antenatal care (ANC), and maternal and neonatal health services in Tanzania.

The ACCESS Program in Tanzania has provided technical assistance to the MOHSW, including the Reproductive and Child Health Section (RCHS), the National AIDS Control Programme (NACP) and the Human Resources Development Directorate, to improve pre-service education in both nursing and medical schools. Since 2004, ACCESS has helped to improve pre-service education on reproductive health/ANC in nursing schools, working with all 53 nursing and midwifery certificate, diploma, and higher degree schools to revise curricula, create learning guides for both teachers and students, and design skills labs for students. In May 2009, ACCESS began working with all of Tanzania's five medical schools to strengthen the theory and clinical practice for comprehensive HIV care.

ACCESS will work with each school to ensure that HIV content is integrated with all aspects of the medical education curriculum. Additionally, the ACCESS Program has established a national working group for pre-service HIV medical education comprising representatives from each institution that will lead all program activities. ACCESS and the working group have provided technical updates for clinical instructors across all five medical institutions in comprehensive HIV care. All five schools have been provided with educational equipment, such as LCD projectors and laptop computers, to aid them in delivering high-quality lectures and lessons. The schools have also been oriented on the use of this equipment. And to ensure the continuity of competency-based education, ACCESS will support the development of HIV skills labs in all institutions.

ASSESSMENT PURPOSE AND OBJECTIVES

Before program roll-out, a needs assessment was conducted at the participating medical schools. The assessment, which was conducted in July 2009, built on previous experiences and tools of the ACCESS Program in reviewing the current practices, curricular content and capacity of medical institutions to provide comprehensive HIV education. The purpose of the assessment was to determine: 1) the status of each school in teaching updated, evidence- and competency-based practices related to comprehensive HIV care; 2) the structure and suitability of the clinical practice component; 3) any faculty/preceptor training needs; and 4) any teaching or clinical practice equipment needs.

Key questions addressed in the needs assessment were:

- What are currently the core competencies of medical education faculty in providing education on HIV/AIDS prevention, care and treatment services?
- What is the perception of students on technical areas of HIV/AIDS that are well or poorly covered in medical education?
- To what extent are the *Tanzania National Guidelines for the Management of HIV/AIDS* incorporated with curricula and accessible?
- What gaps are present in the existing medical education curriculum in individual schools pertaining to HIV prevention, treatment and care services?
- How can new or updated content be best integrated with existing curriculum?

This report presents the results from the assessments conducted with the students and faculty of the five medical schools.

II. METHODOLOGY

This assessment was conducted at the five medical schools listed below in Table 1.

Table 1. Medical schools participating in needs assessment

Name of Medical Institution	Region
Muhimbili College of Health Sciences (MUHAS)	Dar es Salaam
Kilimanjaro Christian Medical College (KCM College)	Kilimanjaro
Weill Bugando University College of Health Sciences (WBUCHS)	Mwanza
Hubert Kairuki Memorial University (HKMU)	Dar es Salaam
International Medical and Technical University (IMTU)	Dar es Salaam

METHODOLOGY AND SAMPLE

A self-administered, structured questionnaire was given to all deans, selected faculty and third- and fourth-year students from all the schools. In addition, focus group discussions (FGDs) were held by school—generally, one with students and one with faculty (WBUCHS had two student FGDs and MUHAS and KCM College had no staff FGDs). Each FGD had 12–15 participants. FGDs were conducted in *Kiswahili* language, recorded using tape recorders, and later transcribed and coded by members of the assessment team.

As part of the assessment, deans, heads of department, other academic staff and clinical year students (fourth and fifth years, and in one case third-year students) were interviewed. All deans were reached, while the number of academic staff and students reached depended on the response rate (see Table 2 on the following page).

Table 2. Respondents to the needs assessment survey

University	Dean	Response Rate*	Department Heads	Response Rate	Academic	Response Rate	Students	Response Rate**
HKMU	1	100%	8	100%	12	63 %	38	40%
IMTU	1	100%	11	73%	10	11%	31	34%
MUHAS	1	100%	5	27%	5	5 %	45	11%
KCM College	1	100%	1	6%	5	10 %	20	48%
WBUCHS	1	100%	9	56%	14	40%	50	45%
Total	5	100%	34	64%	46	(average) 26%	184	(average) 37%

*Response rate was taken out of the total number of eligible, not out of the number who were given forms.

**Eligibility criteria were different for different schools. Some assessment teams only included fourth- and fifth-year students, while others used all students.

With the approval from MOHSW/NACP, the following data collection tools were used:

- Self-assessment questionnaire for medical school deans/heads of school
- Self-assessment questionnaire for heads of department
- Self-assessment questionnaire for academic staff
- Self-assessment questionnaire for students
- Focus group discussion guide for medical students
- Focus group discussion guide for staff/faculty

CONSTRAINTS AND LIMITATIONS

The major constraint in the findings was the low response rates, which were somewhat expected due to the method of interview (i.e., questionnaires were handed out and requested return rather than administered). The benefit of the method is higher reach, and the downside is low response rate. The response rate was lowest for the students. In addition, the application of the heads of department tool was hindered because, as a mapping exercise, it would have been better to get representation of every department within the medical school to clearly identify gaps. Because of this, the findings should be viewed as indicative of the situation rather than fully representative.

III. RESULTS

STUDENTS

The students reached were a mixture of profiles in terms of their academic tenure at the medical schools, but mainly focused on students in their “clinical years” of study.

Table 3. Number and type of students reached, by school

School	Number of Students	Type of Student	Approximate Response Rate
HKMU	38	4 th and 5 th year students	40%
IMTU	10	4 th and 5 th year students	34%
MUHAS	45	4 th and 5 th year students	11%
KCM College	20	4 th and 5 th year students	48%
WBUCHS	50	3 rd , 4 th and 5 th year students	38%
Total	184	—	

Knowledge of HIV/AIDS According to Students

Students conducted a self-assessment on their knowledge of HIV/AIDS. The areas that students ranked themselves as having higher (high or very high) or lower (low or very low) knowledge are described in Table 4 below.

Table 4. Areas of strength and weakness in knowledge of students

Technical Area	Number/Proportion of Students Ranked Themselves High or Very High Knowledge		Number/Proportion of Students Ranked Themselves Low or Very Low Knowledge	
	n	%	n	%
Clinical manifestations of HIV infection	148	80.4	—	—
Basic scientific HIV/AIDS facts	118	64.1	—	—
PMTCT	119	64.7	—	—
HIV/AIDS epidemiology	109	59.9	—	—
Management of mental health problems in HIV/AIDS	—	—	83	45.1
Community-based HIV/AIDS care for people living with HIV/AIDS (PLWHA)	—	—	77	42.5

Technical Area	Number/Proportion of Students Ranked Themselves High or Very High Knowledge		Number/Proportion of Students Ranked Themselves Low or Very Low Knowledge	
	n	%	n	%
M&E/clinical research pertaining to HIV/AIDS	—	—	71	39
HIV/AIDS program management	—	—	56	30.6

Overall, a relatively low average (30%) of students ranked themselves high or very high in the different HIV/AIDS-related core competencies. Thus, according to students, they themselves felt strong and confident on a relatively limited number of core competencies.

Provision of HIV/AIDS-related Services

Students were also asked to rate their level of confidence in providing HIV/AIDS-related services. The findings from this question are presented in Table 5 below.

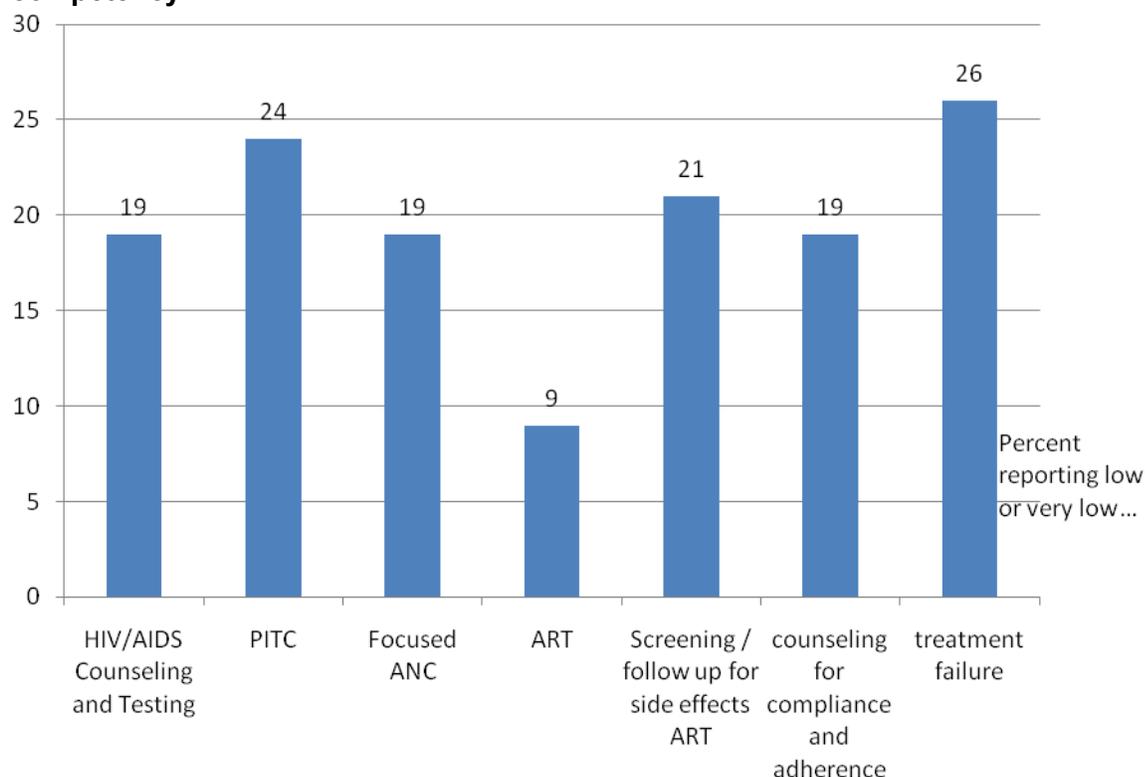
Table 5. Self-reported strengths and weaknesses in service provision, students

Technical Area	Number/Proportion of Students Ranked Themselves Highly Able to Perform (High or Very High)		Number/Proportion of Students Ranked Themselves Poorly Able to Perform (Low or Very Low)	
	n	%	n	%
PMTCT: counseling of pregnant women for HIV testing	120	65.2	—	—
PMTCT: safe delivery	119	64.7	—	—
PMTCT: infant feeding options	118	64.1	—	—
Provision of ART	112	60.9	—	—
Infection prevention (using aseptic technique, decontamination and instrument processing)	105	57.0		
Treatment failure	—	—	48	26.3
Palliative care	—	—	48	26.1
Counseling for compliance and adherence			35	19.1
Syndromic management of STIs	—	—	33	18
Treatment of OIs	—	—	22	12.3

Prevention of mother-to-child transmission of HIV (PMTCT) emerged as an area in which the majority of students felt confident providing services. Thirty-nine percent of students indicated that they felt comfortable with provision of ART. For counseling for compliance and adherence, a full 19% of students indicated that they were not confident in providing this service.

For many of the core competencies that a student would find necessary for the provision of HIV/AIDS services, more than 10% of students reported low or very low confidence. This information is presented in Figure 1, below.

Figure 1. Percentage of students reporting low or very low confidence by core competency



It is clear that, in terms of students' own assessments of their ability to provide services, large numbers/proportions of students did not feel confident providing key elements of HIV services. In the highest ranked technical area (provision of PMTCT), 35% of students still did not feel confident giving the service.

HIV/AIDS Teaching Methodology and Educational Materials

Overall, availability, accessibility and utilization of HIV/AIDS educational materials were considered quite poor by the students.

For close to half (45%) of the respondents, availability, accessibility and utilization of the *Tanzania National Guidelines for the Management of HIV/AIDS* were ranked as unsatisfactory. The majority (114 or 62%) reported that simulations/anatomical models for demonstration of HIV/AIDS-related skills were not available.

Students were not also satisfied with the availability, accessibility and utilization of a variety of educational materials such as CDs/videos, computers, internet access, overhead projectors and LCD projectors. In FGDs, students expressed particular concern on the issue of internet access. While many of the schools have computer labs, a significant number of the computers are unusable due to viruses and a lack of internet connection. Students did not feel that the labs were properly managed or maintained.

Lectures, bedside teaching, teaching rounds and group work were listed as the most commonly used teaching methods.

Findings from the FGDs suggest that many of the lecturers have had no formal training in education, and many of the students find it difficult to follow their lectures and retain the information. Some students suggested that lecturers participate in teacher training programs to improve their ability to educate students. As one final-year student from MUHAS described during the FGD, “Please give our lecturers a course in training skills, some of them clearly have the knowledge but lack the skills to deliver that knowledge to us.” (*Walimu wetu wapewe course ya ualimu, wengine unaona kabisa kuwa wana ufahamu lakini wanashindwa namna ya kuelekeza*)

Coaching, role plays, teleconferences and video conferences are rarely used as teaching methods— only 7.9% of students reported having used these tools in their courses.

Regarding student assessment, all assessment methods exist. Case reviews/audits, objective structured clinical exams (OSCE) and mini-surveys are the least implemented.

Stigma

It appears that students have particular concerns about HIV transmission in the clinical setting. The majority (64.1%) of students reported being worried about contracting HIV from patients. Just over half (50.8%, n=93) also reported a fear of transmitting HIV to patients.

However, more than two-thirds of respondents reported that they were willing to work with staff and students living with HIV/AIDS, and nine out of 10 students were willing to be tested for HIV regularly.

The difference between students and the academic staff in regard to stigma was striking, with students showing a much higher fear of contracting or infecting others with HIV in the clinical setting, but a much higher willingness to test or disclose their own status (see Table 6 on the following page).

Table 6. Students and academic staff respond to stigma

	Students	Academic Staff
Afraid/very afraid of contracting HIV/AIDS	64.1%	17.8%
Ready/very ready to work with HIV-positive staff	71.6%	97.8%
Willing/very willing to test	71.8%	55.6%
Willing/very willing to disclose HIV status	42.7%	31.7%

ACADEMIC STAFF

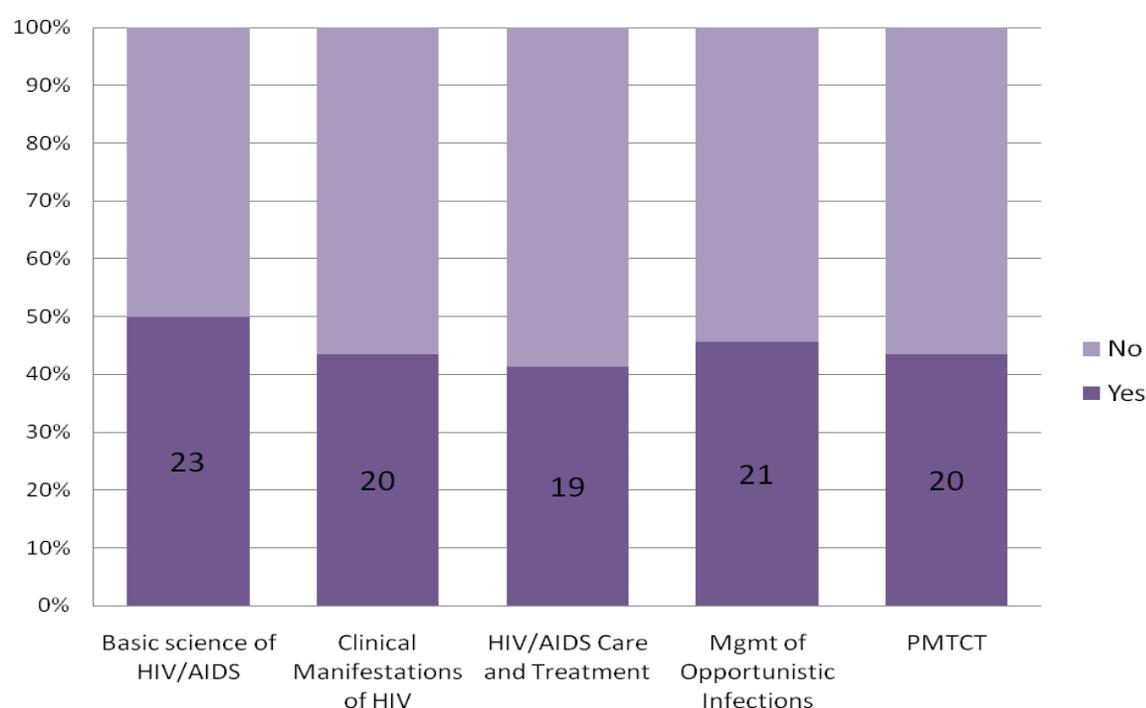
A total of 46 academic staff members were interviewed, including 16 lecturers (35%), 16 assistant lecturers (35%), nine tutorial assistants (20%), two senior lecturers (4%), two associate professors (4%) and one professor (2%). Of these, 32 or 72% indicated that they teach courses that cover HIV/AIDS prevention, care or treatment.

In-service Training in HIV/AIDS

Overall, only one-third of academic staff has had in-service training on HIV/AIDS-related topics.

The top five areas for in-service training are presented in Figure 2, below. These areas include: basic science of HIV/AIDS (50% of academic staff indicated that they had had in-service training), management of OIs (46%), PMTCT (44%), clinical manifestations of HIV (44%), and HIV/AIDS care and treatment (41%). These results are presented in Figure 2, on the following page.

Figure 2. Most frequent areas of in-service training in HIV/AIDS



Conversely, there were areas that were particularly neglected in terms of in-service training, including professionalism/ethics related to HIV (20%), management of mental health for HIV/AIDS (15%), community-based HIV/AIDS care (11%), HIV program management (13%), and M&E and clinical research (4%). These findings are presented in Figure 3.

Figure 3. Least frequent areas of in-service training for academic staff

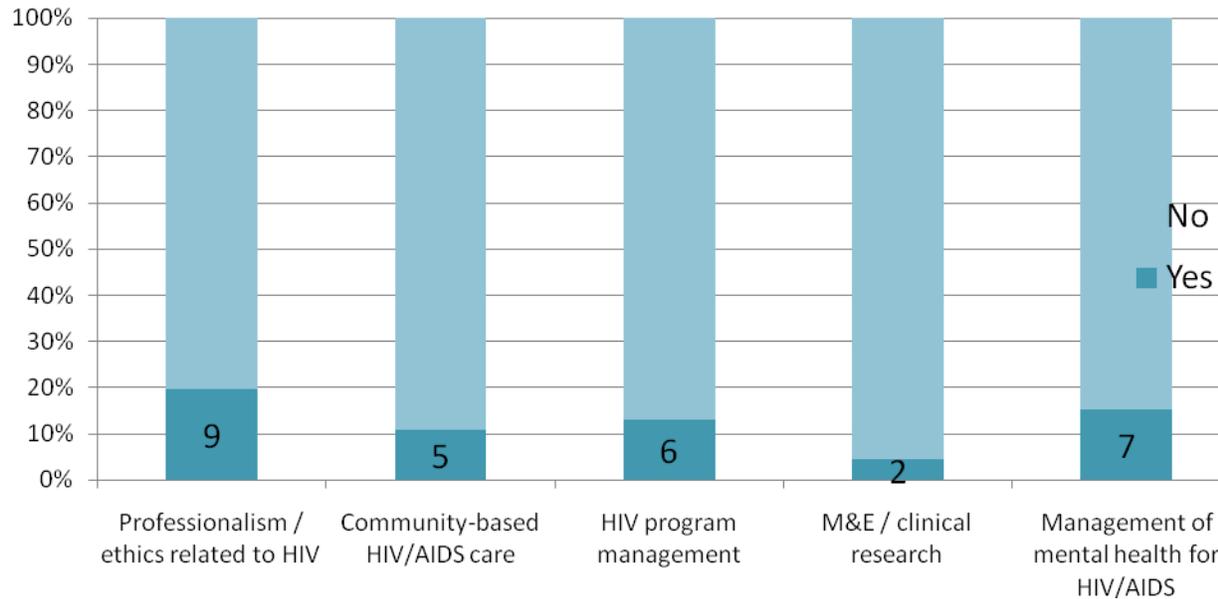
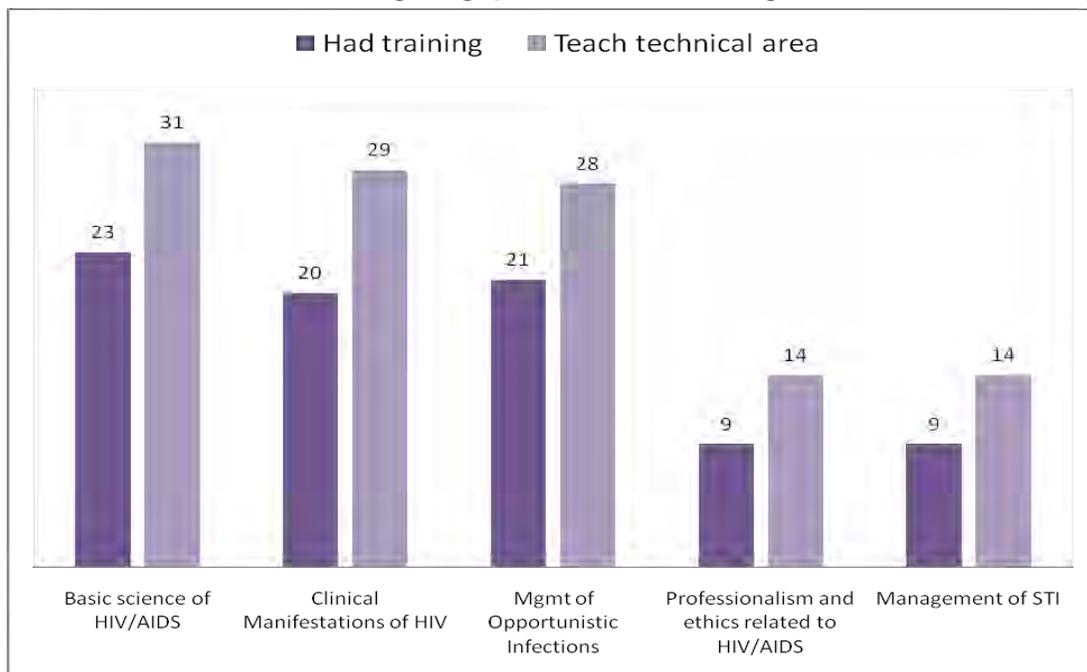


Figure 4 presents the technical areas with the biggest gaps between the number of academic staff teaching a topic and the number of staff who have received in-service training in that same topic.

Figure 4. Technical areas with largest gaps between teaching and in-service training



Teaching and Assessment Methodologies

Teaching Methodologies

A total of 14 academic staff (32%) had received training in effective teaching skills. Two out of three academic staff members have never received any specific training regarding teaching and assessment methodology. These findings were confirmed in FGDs, where staff expressed concern about their lack of training in education.

Half of academic staff reported using general course objectives at the beginning of their courses, but only 20% reported using measurable learning objectives. Almost six out of 10 academic staff do not base performance assessments of their students on HIV/AIDS-related course objectives.

In FGDs, staff felt strongly that a standard procedure and curriculum for HIV/AIDS education should be put into place for all medical schools in Tanzania. Staff also felt that if such a structure were maintained, the program could be more comprehensive and concise and would avoid repetition, making room in the schedule for more training activities in practical skills.

Table 7 presents a breakdown of the most frequent teaching methods employed by academic staff. The responses of the academic staff reflect what students reported: a large reliance on lectures, seminars and tutorials. Only half of academic staff reported using bedside teaching, and very few use role plays and coaching.

Table 7. Teaching methodologies employed by responding academic staff

Methodology	n	%
Lectures	41	95.3
Tutorials	29	67.4
Bedside teaching	20	46.5
Teaching rounds	17	39.5
Group work	19	44.2
Demonstrations	21	48.8
Coaching	7	16.3
Role plays	8	18.6
Video conferencing	1	2.3
Self-study/research in reference materials	8	18.6

Marker pens and white boards or flip charts are the most used teaching aids (n=29, 67.4%). Almost half of academic staff use overhead or slide projectors. Simulations/anatomic models are used by only 11.6% (5) of academic staff. Seventy percent (n=30) use laptops and LCD projectors. Almost half of the respondents estimate having poor internet access. Clinical equipment and supplies dedicated to teaching are generally considered insufficient. The majority of academic staff is not satisfied with the availability of up-to-date periodicals on HIV/AIDS. Almost 40% are not satisfied with access to up-to-date *Tanzania National Guidelines for the Management of HIV/AIDS* and text books.

In FGDs, staff indicated a need for support with the use of audiovisual facilities and e-learning materials. These aids could help instructors overcome the high student-to-staff ratio.

No specific assessment was conducted on the utilization of Web-based resources, but further discussion with medical institutions' focal persons revealed that resources such as PubMed and HINARI (a WHO access to research initiative) were used, but that Google Scholar was unknown to most faculty. In general, schools were seen as dramatically underutilizing Web-based resources.

Student Assessment Methodologies

Assessment methodologies were said to be generally lacking in objectivity at all of the schools, and need to be addressed. In addition, staff explained in FGDs that there is a disconnect between the material that is taught and the material that is assessed. The assessment methods were also recognized to be less than objective, and application tends to vary between different staff members within the same institution. Standardization and guidelines (and adherence to said guidelines) could help eliminate this divergence.

Table 8 presents an overview of assessment methodologies at the different schools.

Table 8. Overview of assessment methodologies at the academic institutions

School	Description of Methodologies Employed
MUHAS	<p>For undergraduates, multiple choice questions (MCQs), short answer and essays are predominantly employed. Clinical students are given a real, randomly selected case.</p> <p>OSCE is employed only in OB/Gyn department. Some departments have tried to rank the cases in terms of the importance of the case and how well the student performs, using criteria to improve objectivity—this varies by department.</p>
HKMU	<p>Generally, MCQs and short answer questions, short and long essays are employed. In 4th and 5th year, students are assessed using problem-solving questions. Practical exams (e.g., looking at slides for microbiology departments) are conducted by most departments. Oral examinations are employed by some departments. Clinical examinations with actual patients are conducted for 4th and 5th year students.</p>
WBUCHS	<p>Generally, case studies with MCQs and short answer (generally 3-hour exams). Undergraduates conduct oral exams for most departments. Practical exams are conducted by some departments (especially pathology, microbiology, parasitology and anatomy).</p> <p>Clinical exams are conducted for 3rd–5th year students, including 2 short cases and 1 long case per student with actual patient (employed by most departments). Clinical logbooks are used from 3rd year onward; the weight varies by department.</p> <p>External rotations (community or research) that are assessed via pass/fail basis, but not in a very objective format.</p> <p>Final year/qualifying exam: 1 long and 2 short cases per major area (surgery, internal med, OB/Gyn, pediatrics) and 3-hour written paper. This contributes 60% of the grade and logbook/continual assessment contribute 40%. Must pass clinical exam to pass the exam.</p>

School	Description of Methodologies Employed
KCM College	<p>Year 1 and 2: written exams (MCQs and short answer/true and false, fill in the blanks, label diagram). In the clinical years (years 3–5), clinical skills practical training— followed by assessment by OSCE.</p> <p>Following each rotation, students are assessed by long case examination (given a patient, present to a panel for 20 minutes). Throughout the rotation, students are tracked using logbooks that are completed by supervisor. This is marked and scored, and accounts for 30% of the score for the semester. Written exams are used at the end of the rotation.</p> <p>In year 4, students are assessed on a 4 week attachment period or research project outside the university, with a report produced. They also conduct a DMO rotation, and report on this.</p> <p>Specializations such as ENT, ophthalmology, are assessed using written exams and long case. These scores are consolidated to allow for passing to year 5.</p> <p>Year 5 conduct the major rotation. Assessment consists of logbooks plus long case (clinical examination), finished by written exam for year 5 (consists of two papers for each rotation, each paper 3 hours). OSCE is used in year 5 for the qualifying examination.</p>
IMTU	<p>Year 1 and 2: written exams (MCQs and short answer/true and false, fill in the blanks, label diagram); clinical years (3–5) clinical skills practical training— followed by assessment by OSCE; following rotation, are assessed by long case examination, short case and OSCE. Throughout the rotation, students are tracked using logbooks that are filled by supervisor (introduced recently).</p> <p>Attachment period or research project is conducted outside of the medical school for 4 weeks, with a report produced. DMO rotation with a report (no criteria for assessment of the attachment period).</p> <p>Specializations, such as ENT, psychiatry, anesthesia, orthopedics, oncology, ophthalmology, are assessed using the written exams and long case. These scores are consolidated to allow for passing to year 5.</p> <p>Year 5 conduct the major rotation. Assessment consist of logbooks plus long case (clinical examination), finished by written exam for year 5 (consists of two papers for each rotation, each paper 3 hours). OSCE is used in year 5 for the qualifying examination.</p>

HEADS OF DEPARTMENT

At the five schools, a total of 34 heads of department were interviewed.

Table 9. Number of department heads interviewed, by school

School	Number of Heads of Departments Interviewed
MUHAS	5
KCM College	1
WBUCHS	9
HKMU	8
IMTU	11
TOTAL	34

The head of department interview focused on which domains of knowledge and skills are covered in different school departments, and enabled identification of overlaps. Thus, the findings are most useful presented in the context of each individual institution, so as to see which departments are addressing different knowledge and skills domains. However, some notable information on the most and least addressed skills and knowledge domains overall is presented in Table 10.

Some domains of skills and knowledge were notably under-represented in the curricula. Table 10 below presents some of the knowledge domains that appear to be most poorly represented in curricula, according to heads of department.

Table 10. Knowledge domains on HIV/AIDS according to department heads

Knowledge Domain	Number of Department Heads Reporting that It Is Covered*	Number of Department Heads Reporting that It Is Not Covered
Basic principles of monitoring patients on ART	8	20
Basic principles of changing ART	6	22
Principles of ART adherence	5	23
Pediatric ART	4	24
Management of OIs in HIV/AIDS	10	18
Managing HIV/TB co-infection	7	21
Basic knowledge of HIV/AIDS in pregnancy	5	23
Core interventions of PMTCT	5	23
Principles of HIV/AIDS infection prevention in clinical setting	10	18
Syndromic management of STIs	4	24
Male circumcision	4	24

*Because this is pooled information for all five schools, if less than five departments are covering it, it means that at least one school is not covering at all.

The bolded entries in the table above show knowledge domains that are covered by less than five departments in the five schools, and thus represent domains that at least one school is not covering. (A breakdown of reported knowledge domains by university is presented in Annex 1)

It is notable that the teaching of knowledge domains related to pediatric ART, syndromic management and male circumcision are limited to four departments. This means that at least one school is not teaching male circumcision and syndromic management of STIs at all.

The mapping exercise also revealed that there were some important skills domains on HIV/AIDS that very few of the departments covered (see Table 11).

Table 11. Skills domains on HIV/AIDS according to department heads

Knowledge Domain	Number of Department Heads Reporting that It Is Covered	Number of Department Heads Reporting that It Is Not Covered
Take an appropriate history including social issues and HIV	10	18
Perform physical examination and assess mental status in HIV	6	22
Perform and interpret HIV laboratory results	6	22
Apply WHO criteria for diagnosis and staging	8	20
Initiate first line ART regimen according to national guidelines	7	21
Monitor patients on ART identify and manage ART side effects	5	23
Perform clinical and laboratory monitoring of patients on ART	4	24
Screen, manage and prevent opportunistic infections	8	20
Recognize immediate life-threatening conditions and medical emergencies related to HIV/AIDS	4	24
Conduct HIV test and interpret test results	10	18
Provide focused antenatal care and conduct safer obstetric practices for HIV-positive mothers	3	25
Provide short-courses ARV prophylaxis (mother and child)	4	24
Discuss and demonstrate infant feeding options for HIV-positive people	3	25
Refer HIV patients to community care and support groups	2	26

The bolded entries in the table above show skills domains that are covered by less than five departments in the five schools, and thus represent domains that at least one school is not covering. (A breakdown of reported skills domains by university is presented in Annex 2.)

Emerging from the FGDs was the suggestion that collaborations between universities and research institutions, such as the National Institute for Medical Research (NIMR), should be strengthened, and the link between these institutions and students should be facilitated and reinforced. This strengthening would allow students to have a meaningful rotation in research.

IV. RECOMMENDATIONS

Students reported low confidence in the provision of many of the core competencies for HIV/AIDS care, treatment and prevention. For example, roughly 20% of students indicated that they were not comfortable with their skills in ART compliance and adherence, and 26% were not comfortable with provision of palliative care or what to do in case of treatment failure of ART. In addition, deans' interviews showed that some of the key core competency areas that are part of national policy are not covered adequately (e.g., male circumcision, pediatric ART, ART adherence counseling, syndromic management of STIs, palliative care, home-based care in PLWHA, and basic principles of mental health related to HIV/AIDS). Curricula need to be standardized and strengthened, while being tied to the core competencies outlined in the *Tanzania National Guidelines for the Management of HIV/AIDS*. Competency-based learning also needs to be improved or introduced, so that students can translate knowledge on HIV/AIDS into competency.

A total of 64% of students reported that they were afraid of contracting HIV from patients. This percentage indicates a need to improve education in HIV transmission and infection prevention, and to work on attitudes in the academic and health care settings where students are conducting their practical exams.

Overall, only one-third of academic staff has had in-service training on HIV/AIDS-related topics. There is a clear need for expanding access to in-service training for academic staff and faculty on the core competencies of HIV/AIDS as defined by the *Tanzania National Guidelines for the Management of HIV/AIDS*.

Only one-third of academic staff (32%) had received training in effective teaching skills. Training methodologies reflect this, with heavy reliance on lectures and seminars, less than half conducting bedside teaching, and very few using role plays or demonstrations. Effective teaching skills training and follow-up support and supervision are needed to improve the quality of education.

The use of skills labs was notably low, which is even more concerning given the crowded nature of the teaching facilities. Students often do not get a chance to practice skills on models or real patients. The introduction of skills labs, along with orientation to both students and faculty, and incorporation with teaching of faculty, is recommended.

Student assessment methodologies were reported—by both faculty and students—to be generally not very objective or consistent, and often assessment is not tied closely to course objectives and core competencies. Some improvements have been made in student assessment, notably KCM College's work on utilizing OSCE for student assessment. A thorough review of the assessment methodologies of the five schools is recommended, which will likely result in progress toward improved and standardized assessment methodologies, such as validated test questions and competency-based assessment.

While 82% of academic staff indicated that they reference the *Tanzania National Guidelines for the Management of HIV/AIDS* in their course material, approximately half (48%) of students rated access to the *Guidelines* as low or very low. Thus, access to and availability of the

Tanzania National Guidelines for the Management of HIV/AIDS should be improved for students in particular.

Finally, each school is recommended to undertake a mapping of HIV/AIDS core competencies to understand where (or if) the competencies are being addressed, as some overlaps and gaps are evident. This mapping should be completed on a school-by-school basis, since all the schools differ in their class schedules and content.

V. RESULTS BY SCHOOL

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

Students

At MUHAS, 45 students were interviewed (34 males and nine females).

Knowledge

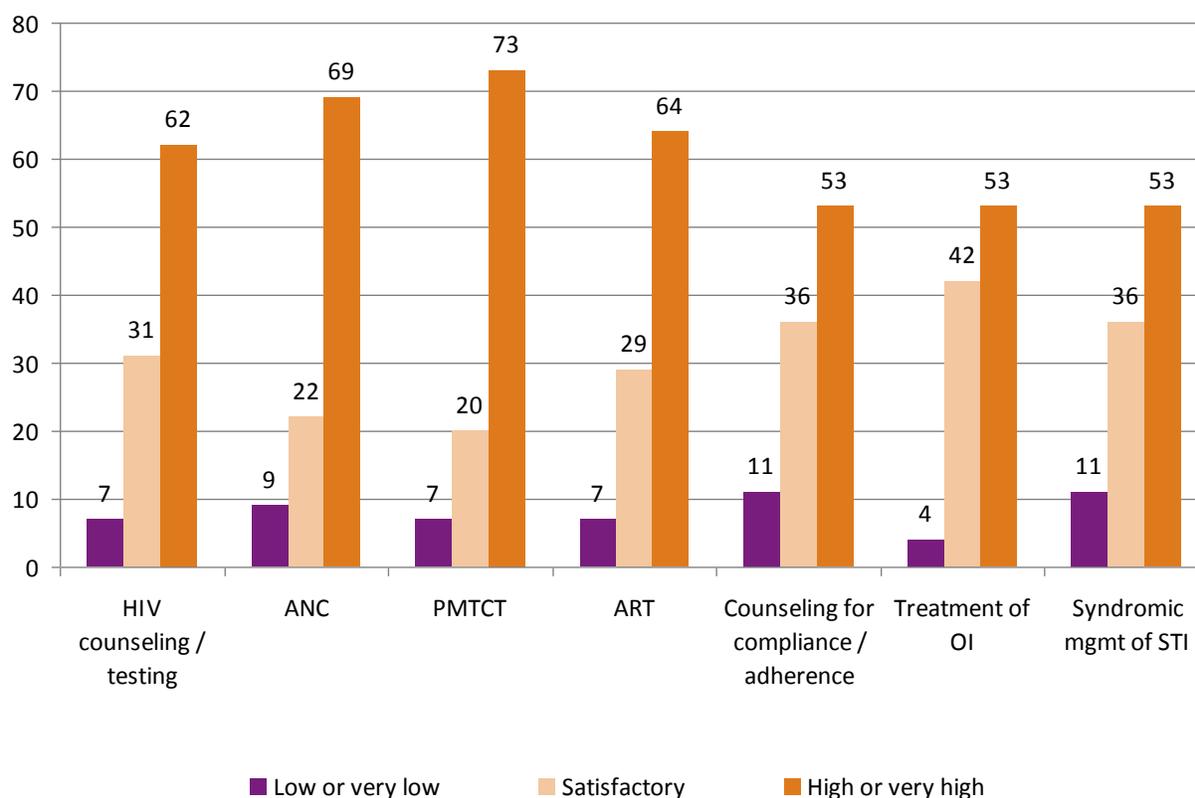
Students at MUHAS generally had stronger self-reported confidence on many of the knowledge domains compared to the other schools. Students' self reported knowledge is presented in Table 12, below.

Table 12. MUHAS students self-reported confidence on knowledge domains

Teaching Area	Students Report Very Low and Low		Students Report Satisfactory		Students Report High and Very High	
	n	%	n	%	n	%
HIV counseling and testing	3	6.7%	14	31.1%	28	62.2%
PITC	4	8.9%	19	42.2%	22	48.9%
ANC	4	8.9%	10	22.2%	31	68.9%
Mother-to-child transmission	3	6.7%	9	20%	33	73.3%
ART	3	6.7%	13	28.9%	29	64.4%
Screening and follow up side effects	8	17.8%	14	31.1%	23	51.1%
Counseling for compliance and adherence	5	11.1%	16	35.6%	24	53.3%
Treatment failure	5	11.1%	21	46.7%	19	42.2%
Treatment of OIs	2	4.4%	19	42.2%	24	53.4%
Prevention of infection in the work place	3	6.7%	13	28.9%	29	64.4%
Syndromic management of STIs	5	11.1%	16	35.6%	24	53.3%
Palliative care	7	15.6%	14	31.1%	24	53.3%
Infection prevention in clinical setting	4	8.9%	12	26.7%	29	64.4%

Student confidence on different key knowledge domains in HIV/AIDS is presented in Figure 5, below. In general, MUHAS students reported a much higher level of confidence than students at other universities.

Figure 5. Percentage of MUHAS students' confidence in key HIV/AIDS knowledge domains



Twenty-two percent of students reported being “not confident” in M&E or clinical research pertaining to HIV/AIDS. In FGDs, some students explained that while they had been taught the theoretical principals behind M&E, program design and management, they did not possess the practical skills needed to adequately perform in these areas.

The course Clinical Manifestations of HIV Infection was viewed as less satisfactory by the MUHAS students. And some students suggested that the community rotations be moved from the beginning of the community-based HIV/AIDS course to the end. This change would allow the students to become comfortable with the material before applying it in the community.

Students also noted scarcity of educational materials, such as CDs, videos, computer labs and internet access.

Stigma

A surprisingly high proportion of MUHAS students are afraid of contracting HIV from patients (91.1%, n=41). Students are also afraid of transmitting HIV to patients (60.0%, n=27). This high level of fear should be addressed with improved instruction on infection prevention and modes of HIV transmission in the clinical setting.

Academic Staff

Only five academic staff members were interviewed at MUHAS. This small number (very low proportion of overall staff) means that these findings should be viewed as indicative of the situation rather than fully representative.

Between three and four respondents indicated that their training had covered:

- Basic scientific facts regarding HIV/AIDS epidemiology and prevention
- Clinical manifestations of HIV infection
- HIV/AIDS care and treatment
- Management of OIs
- PMTCT
- Management of HIV/TB co-infection
- Infection prevention in clinical settings
- Counseling related to HIV treatment and adherence

Of the five staff interviewed, two taught classes specific to HIV/AIDS. The classes included: basic scientific facts, clinical manifestations of HIV infection, and associated conditions and management of OIs.

It appears that attention to effective teaching skills is needed for academic staff. Of the five total, four respondents reported that they did not introduce measurable learning objectives at the beginning of each session of their course, and just one of them bases the assessment of their students' performance on HIV/AIDS-related course objectives. The main mode of teaching reported was lectures and seminars; no one reported using group work, video conferences, anatomic models, video, self-study or research in reference materials.

Three of the five reported that anatomic models are not available. Four of the five use an overhead projector, and only one uses chalk and black boards. Internet accessibility was also considered poor by academic staff, as well as clinical equipment and supplies. Three also reported that up-to-date text books are scarce.

Heads of Department

Only five heads of department were interviewed at MUHAS, and they represented a small portion of the total department heads at MUHAS. However, the following skills and knowledge domains were reported as not being part of the curricula in the departments. This does not, however, mean that they are not taught at MUHAS at all, rather that they are not included in the departments interviewed. Further review should be conducted to make sure that these topics are indeed covered.

Table 13. Selected skills and knowledge domains not mentioned in heads of department interview, MUHAS

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
The basic pharmacology and classification of ART	Recognize immediate life-threatening conditions and medical emergencies for HIV/AIDS
Principles of ART adherence	Primary education of couples and provision of family planning
Basic knowledge on HIV/AIDS in pregnancy	Diagnose and manage STIs using syndromic approach
Principles of syndromic management of STIs	Initiate and coordinate home-based care
The role of home-based care in PLWHA	Provide family planning counseling in relation to HIV/AIDS infection
Basic principles of mental health problems in HIV/AIDS	Conduct effective health education on HIV/AIDS-related issues
Basic principles of human behavior related to HIV infection	Conduct patient education on prophylaxis for OIs
Knowledge attitudes and practice of community members regarding HIV	Steps in conducting community diagnosis
Beneficial and harmful traditional practices of the community	
The role of gender consideration in HIV/AIDS health education	
Steps in conducting community diagnosis	
Global and local trends in morbidity and mortality of HIV/AIDS	
Basic principles of managing HIV/AIDS programs and community	
Basic principles of M&E of HIV/AIDS programs	
Basic principles of recordkeeping and data management for HIV/AIDS services	
National health management information system (HMIS)	

WEILL BUGANDO UNIVERSITY COLLEGE OF HEALTH SCIENCES (WBUCHS)

Students

At WBUCHS, 50 students were interviewed, of which 52% were male and 48% were female. The students were in their third, fourth and fifth years, and it is estimated that roughly 38% of those students were reached.

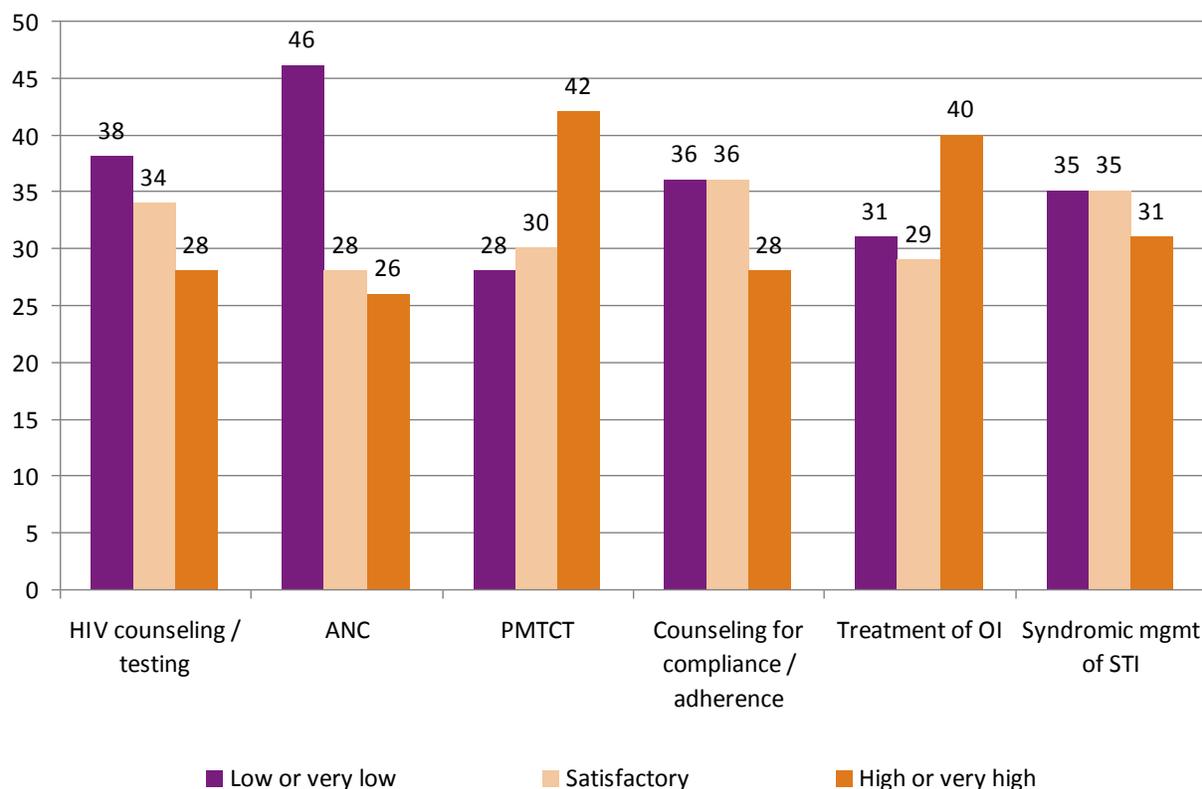
Table 14 shows the confidence levels that students reported in knowledge domains.

Table 14. WBUCHS student confidence in knowledge domains

Teaching Area	Students Report Very Low and Low		Students Report Satisfactory		Students Report High and Very High	
	n	%	n	%	n	%
HIV counseling and testing	19	38%	17	34%	14	28%
PITC	25	50%	15	30%	10	20%
ANC	23	46%	14	28%	13	26%
Mother-to-child transmission	14	28%	15	30%	21	42%
ART	6	12%	15	30%	29	58%
Screening and follow up side effects	16	32%	16	32%	18	36%
Counseling for compliance and adherence	18	36%	18	36%	14	28%
Treatment failure	20	40.8%	15	30.6%	14	28.6%
Treatment of OIs	15	31.2%	14	29.2%	19	39.6%
Prevention of infection in the work place	15	30%	16	32%	19	38%
Syndromic management of STIs	17	34.7%	17	34.7%	15	30.6%
Palliative care	19	38%	16	32%	15	30%
Infection prevention in clinical setting	16	32%	18	36%	16	32%

Student confidence on different key knowledge domains in HIV/AIDS is presented in Figure 6, on the following page.

Figure 6. Percentage of WBUCHS students' confidence in key HIV/AIDS knowledge domains



In the FGDs, students cited HIV-related counseling as an area in which they had not been trained. Some students stated that if they wanted to be proficient, they had to learn on their own.

Another issue that arose in the FGDs was student assessment. Students felt that although the content of the course was in theory and basic science, they were tested on clinical practice. This incongruity may account for the lack of confidence in clinical skills reported in Table 14 above. However, WBUCHS was the only school that reported using Continuous Assessment Tests (CATs) for student assessment.

A high proportion of WBUCHS students are afraid of contracting HIV from patients (88%, n=44). Students are also afraid of transmitting HIV to patients (80%, n=39). This high level of fear of transmission should be addressed with improved instruction on infection prevention and modes of HIV transmission in the clinical setting.

Academic Staff

A total of 14 academic staff members from WBUCHS were interviewed. Of these, almost half have received in-service or short-course training. Between seven and nine respondents indicated that their training programs had covered:

- Basic scientific facts regarding HIV/AIDS
- HIV/AIDS epidemiology and prevention
- Infection prevention in clinical settings

Only one academic staff member among the WBUCHS staff had been trained in effective teaching skills, indicating a gap.

Many of the teaching methodologies reflected this lack of background in effective teaching: for example, nine of the 14 (69%) do not introduce general course objectives (e.g., knowledge, attitude and skills to be acquired) at the beginning of the HIV/AIDS-related courses, and 11 out of the 14 (84.6%) do not introduce measurable learning objectives at the beginning of each session of their course. And nine of the 14 reported that they do not base the assessment of their students on the course objectives.

Thirteen of the 14 interviewed use lectures as a teaching method. No one reported using coaching. Only one reported using role plays, video conferences or teleconferences, while three reported using self-study or research in reference materials.

Only two of those interviewed reported using an overhead projector, and only one reported using simulations/anatomic models. Nine reported using laptops and LCD projectors, or marker pens and white boards or flip charts. Approximately 62% of academic staff felt that access to the internet was fair—this is higher than at other schools.

Heads of Department

Nine heads of department were interviewed at WBUCHS, representing just over half (56%) of the total department heads. However, the following skills and knowledge domains were reported as not being part of the curricula in the departments. This does not mean, however, that they are not taught at WBUCHS at all, rather that they are not included in the departments interviewed. Further review should be conducted to make sure that these topics are indeed covered.

Table 15 below presents selected skills and knowledge domains that the heads of department indicated were not covered in their department’s curricula. For the full list, see Annex 1 and **Annex 2**.

Table 15. Selected skills and knowledge domains not mentioned in Head of Department Interview, WBUCHS

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
Basic principles of managing ART side effects and toxicity	Provide family planning counseling in relation to HIV/AIDS infection
Basic knowledge on HIV/AIDS in pregnancy	Provide counseling for pregnant mothers on PMTCT
Core interventions of PMTCT	Provide ART adherence counseling
Principles of palliative care	Provide nutritional counseling in patients with HIV/AIDS
Basic principles of HIV/AIDS counseling	Demonstrate utilization of the health management information system (HMIS)
Basic principles of human behavior related to HIV infection	Recognition of ethical and medical issues in patient documentation

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
The role of home-based care in PLWHA	Refer HIV patients to community care and support groups
Knowledge attitudes and practice of community members regarding HIV	Provide focused antenatal care and conduct safer obstetric practices for women with HIV infection
Principles of stigma and discrimination alleviation	Discuss and demonstrate infant feeding options for HIV-positive infants
The role of gender consideration in HIV/AIDS health education	Diagnose and manage STIs using syndromic approach
Steps in conducting community diagnosis	
Basic principles of managing HIV/AIDS programs and community	
How to translate research findings into policy	
Basic principles of M&E of HIV/AIDS programs	

KILIMANJARO CHRISTIAN MEDICAL COLLEGE (KCM COLLEGE)

Students

At KCM College, 20 students were interviewed, of whom 47% were male and 53% were female. The students included fourth- and fifth-year students, and it is estimated that roughly 48% of those students were reached. Given that such a low proportion of students were reached, results should be viewed as indicative of the situation rather than fully representative.

Table 16 below shows the confidence that students reported on knowledge domains.

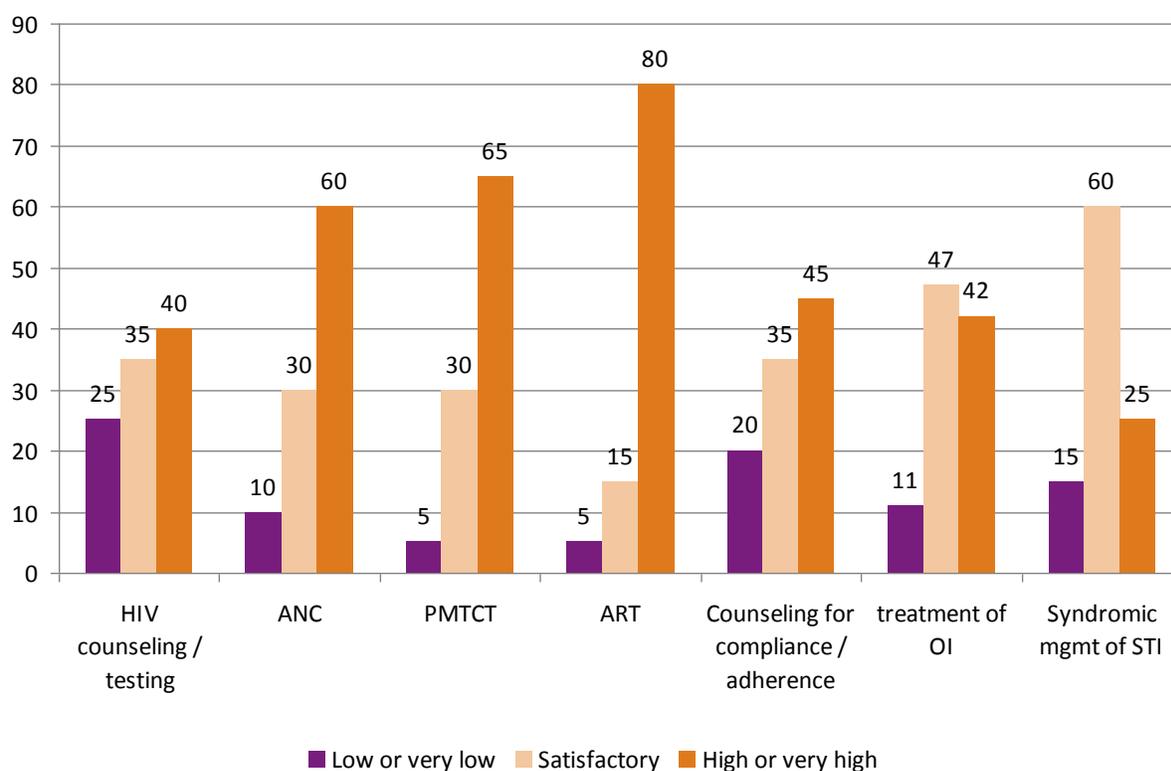
Table 16: KCM College students' self-reported confidence in HIV/AIDS knowledge domains

Teaching Area	Students Report Very Low and Low		Students Report Satisfactory		Students Report High and Very High	
	n	%	n	%	n	%
HIV counseling and testing	5	25%	7	35%	8	40%
PITC	5	25%	7	35%	8	40%
ANC	2	10%	6	30%	12	60%
Mother-to-child transmission	1	5%	6	30%	13	65%
ART	1	5%	3	15%	16	80%
Screening and follow up side effects	1	5%	8	40%	11	55%
Counseling for compliance and adherence	4	20%	7	35%	9	45%
Treatment failure	4	20%	8	40%	8	40%

Teaching Area	Students Report Very Low and Low		Students Report Satisfactory		Students Report High and Very High	
	n	%	n	%	n	%
Treatment of OIs	2	10.5%	9	47.4%	8	42.1%
Prevention of infection in the work place	1	5%	8	40%	11	55%
Syndromic management of STIs	3	15%	12	60%	5	25%
Palliative care	5	25%	10	50%	5	25%
Infection prevention in clinical setting	4	20%	5	25%	11	55%

Student confidence in different key knowledge domains in HIV/AIDS is presented in Figure 7, below.

Figure 7. Percentage of KCM College students' confidence in key HIV/AIDS knowledge domains



Concerning educational materials, CDs, videos, computers and internet access are the least available. Specifically, students expressed concern in the FGDs regarding the availability of the *Tanzania National Guidelines for the Management of HIV/AIDS*. These *Guidelines* are in high demand at KCM College, but there are very few copies available.

Academic Staff

Only five academic staff members were interviewed at KCM College. This small number (very low proportion of overall staff) means that these findings should be viewed as indicative of the situation at KCM College rather than fully representative.

Of the five interviewed, only one had received in-service or short-course training; this course was not in an HIV/AIDS-related topic, but in preparation of training materials and quality assurance in higher education.

In terms of teaching methodology, three of the five respondents introduce general course objectives at the beginning of the course, but only one of the five respondents introduce measurable learning objectives at the beginning of each session.

All KCM College academic staff interviewed reported using lectures and tutorials as teaching methods, and all five reported regularly using a laptop and LCD projector. No one reported using video conferences, self-study or research in reference materials.

Three of five reported being satisfied with audio/visual capability, and four of five are satisfied with access to up-to-date periodicals. And three out of the five reported that access to internet is poor.

Heads of Department

Only one head of department was interviewed at KCM College, meaning that the skills and knowledge domains mapping exercise was not useful and thus the results are not presented.

HERBERT KAIRUKI MEMORIAL UNIVERSITY (HKMU)

Students

At HKMU, 38 students were interviewed, of which 37% were male and 63% were female. The students included fourth- and fifth-year students, and it is estimated that roughly 40% of those students were reached. Given that such a low proportion of students were reached, results should be viewed as indicative of the situation rather than fully representative.

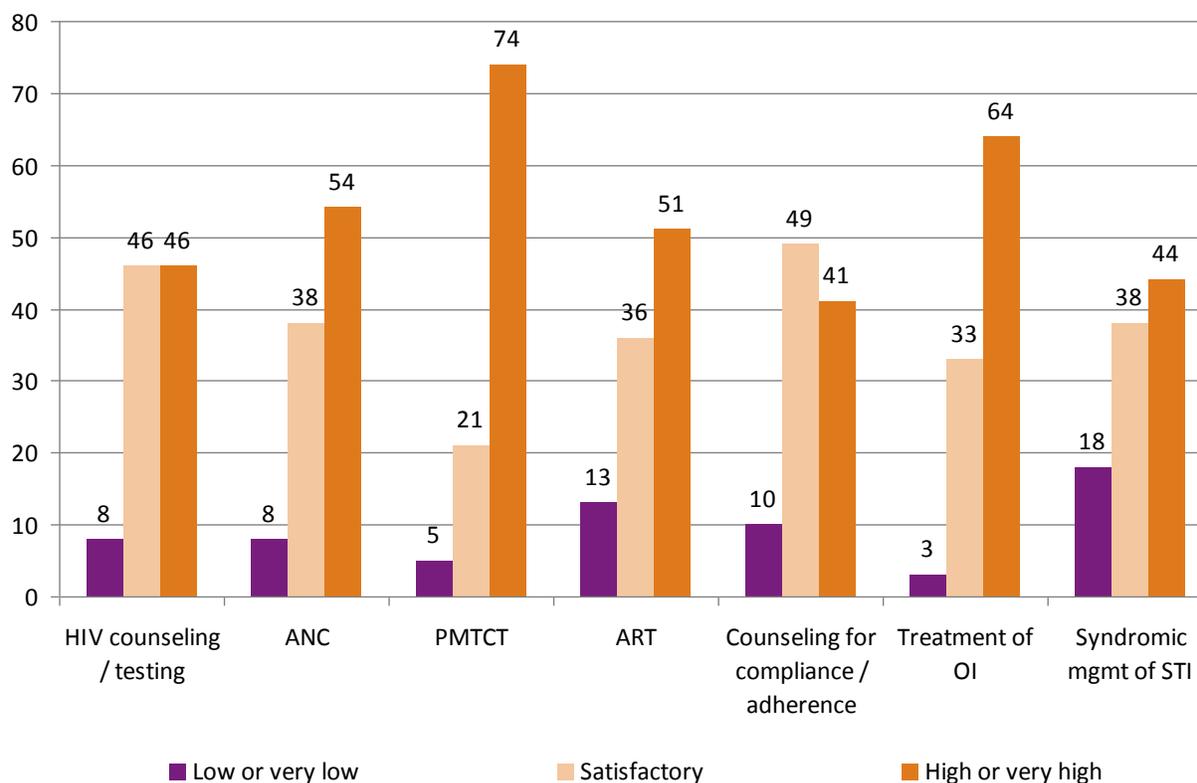
Table 17 below shows the confidence that students reported on knowledge domains.

Table 17. HKMU students' self-reported confidence in HIV/AIDS knowledge domains

Teaching Area	Students Report Very Low and Low		Students Report Satisfactory		Students Report High and Very High	
	n	%	n	%	n	%
HIV counseling and testing	3	7.6%	18	46.2%	18	46.2%
PITC	6	15.4%	20	51.3%	13	33.3%
ANC	3	7.7%	15	38.5%	21	53.8%
Mother-to-child transmission	2	5.1%	8	20.5%	29	74.4%
ART	5	12.8%	14	35.9%	20	51.3%
Screening and follow up side effects	9	23.7%	18	47.4%	11	28.9%
Counseling for compliance and adherence	4	10.3%	19	48.7%	16	41%
Treatment failure	11	28.2%	21	53.9%	7	17.9%
Treatment of OIs	1	2.6%	13	33.3%	25	64.1%
Prevention of infection in the work place	4	10.3%	10	25.6%	25	64.1%
Syndromic management of STIs	7	17.9%	15	38.5%	17	43.6%
Palliative care	11	28.2%	12	30.8%	16	41%
Infection prevention in clinical setting	3	7.7%	17	43.6%	19	48.7%

Student confidence in different key knowledge domains in HIV/AIDS is presented in Figure 8. HKMU students generally reported higher confidence than other schools, with the exception of MUHAS.

Figure 8. Percentage of HKMU students' confidence in key HIV/AIDS knowledge domains



In FGDs, students explained that while they excelled in a theoretical understanding of HIV/AIDS-related services, they lacked practical skills and knowledge.

A high proportion of HKMU students are afraid of contracting HIV from patients (85%, n=33). Students are also afraid of transmitting HIV to patients (56%, n=22). This high level of fear of transmission should be addressed with improved instruction on infection prevention and modes of HIV transmission in the clinical setting.

Academic Staff

All 12 academic staff members were interviewed at HKMU. This response rate means that these findings should provide a full picture of the situation at HKMU.

Of the staff interviewed, almost half have received in-service or short-course training. Between four and five respondents indicated that their training had covered:

- Basic scientific facts regarding HIV/AIDS
- PMTCT
- Clinical manifestations of HIV infection and related conditions
- HIV/AIDS care and treatment
- Management of OIs

- HIV counseling and testing
- Counseling related to HIV testing and treatment adherence

Only three or 25% of academic staff from HKMU have received training on effective teaching skills. Correspondingly, 75% report that they do not introduce measurable skills learning objectives at the beginning of each session of their course. Only one person reported that their training had covered electronic teaching/learning materials.

All but one reported using lectures as the main teaching method; two-thirds do not use teaching rounds and coaching; and only one is using role plays. No one is using video conferences.

Out of 12, ten stated that they do not use simulations/anatomic models, but mostly because of non-availability of models. Two-thirds reported using laptops and LCD projectors.

There was a high level of dissatisfaction with internet accessibility and availability of up-to-date periodicals on HIV/AIDS.

Heads of Department

Because all heads of departments were interviewed at HKMU, the mapping exercise on skills and knowledge domains for HIV/AIDS is valid. The following skills and knowledge domains were reported as not being part of the curricula in the departments. Further review should be conducted to make sure that these topics are indeed covered.

Table 17 below presents selected skills and knowledge domains that the heads of department indicated were not covered in their department's curricula. For the full list, see Annex 1 and **Annex 2**.

Table 17. Selected skills and knowledge domains not mentioned in Head of Department Interview, HKMU

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
Principles of ART adherence	Provide ART adherence counseling
Pediatric ART	Provide nutritional counseling in patients with HIV/AIDS
Use of ART during pregnancy	Conduct patient education on prophylaxis for OIs
Principles of HIV/AIDS infection prevention in clinical settings	Conduct community diagnosis
Perform physical examination and assess mental status in HIV	Identify community resources and plan interventions with community
Perform and interpret HIV laboratory results	Participate in policy development for HIV/AIDS prevention

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
Perform clinical and laboratory monitoring of patients on AR	Demonstrate leadership and management role
Initiate second line regimens when needed and manage treatment	Set up and monitor infection prevention program in clinical settings
Recognize immediate life-threatening conditions and medical emergencies for HIV/AIDS	Monitor and evaluate HIV/AIDS programs
Provide post-exposure prophylaxis for occupational exposure	Collect, analyze, interpret and disseminate health-related data
Discuss and demonstrate infant feeding options for HIV-positive infants	Apply problem solving critical thinking and research to improve
Refer HIV patients to community care and support groups	Maintain accurate and complete inventory system
Diagnose and manage STIs using syndromic approach	
Steps in conducting community diagnosis	
Basic principles of planning HIV/AIDS projects and community	
Understanding of the national HIV/AIDS prevention and treatment	
How to translate research findings into policy	
Basic principles of leadership and management	
Basic principles of management of drugs, equipment and labor	
Program related communication and reports writing	
National health management information system (HMIS)	

INTERNATIONAL MEDICAL AND TECHNICAL UNIVERSITY (IMTU)

Students

At IMTU, 31 students were interviewed, of which 62% were male and 38% were female. The students included fourth- and fifth-year students, and it is estimated that roughly 34% of these students were reached. Given that such a low proportion of students were reached, results should be viewed as indicative of the situation rather than fully representative of all fourth- and fifth-year students at IMTU.

Table 18 shows the confidence that students reported on knowledge domains.

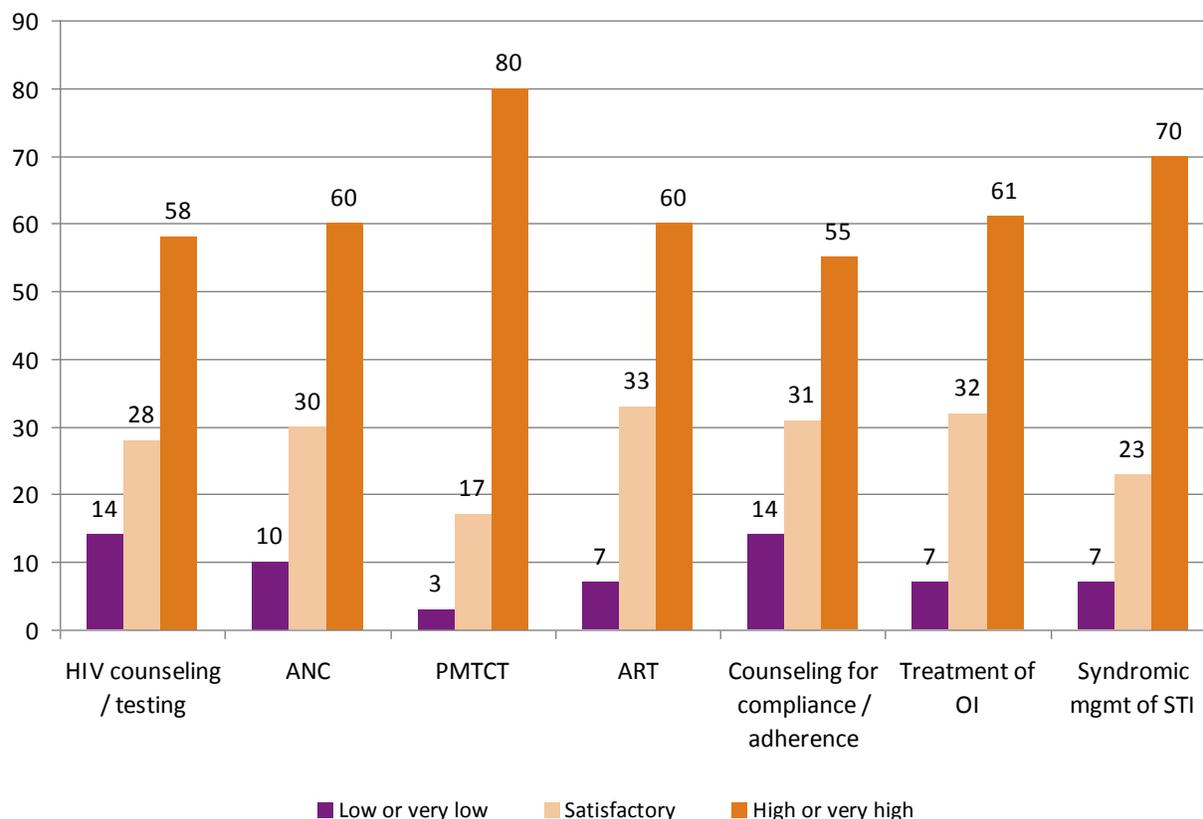
Table 18. IMTU students' self-reported confidence in HIV/AIDS knowledge domains

Teaching Area	Students Report	Students Report	Students Report
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	Very Low and Low		Satisfactory		High and Very High	
	n	%	n	%	n	%
HIV counseling and testing	4	13.8%	8	27.6%	17	58.6%
PITC	4	13.3%	9	30%	17	56.7%
ANC	3	10%	9	30%	18	60%
Mother-to-child transmission	1	3.3%	5	16.7%	24	80%
ART	2	6.7%	10	33.3%	18	60%
Screening and follow up side effects	4	13.4%	13	43.3%	13	43.3%
Counseling for compliance and adherence	4	13.8%	9	31%	16	55.2%
Treatment failure	8	26.7%	15	50%	7	23.3%
Treatment of OIs	2	7.1%	9	32.2%	17	60.7%
Prevention of infection in the work place	2	6.7%	7	23.3%	21	70
Syndromic management of STIs	1	3.3%	6	20%	23	76.7%
Palliative care	6	20%	7	23.3%	17	56.7%
Infection prevention in clinical setting	2	6.7%	9	30%	19	63.3%

Student confidence in different key knowledge domains in HIV/AIDS is presented in Figure 9. IMTU was just below MUHAS in terms of student confidence in these key HIV/AIDS knowledge domains.

Figure 9. Percentage of IMTU students' confidence in key HIV/AIDS knowledge domains



A high proportion of IMTU students are afraid of contracting HIV from patients and transmitting HIV to patients (70%, n=21). This high level of fear of transmission should be addressed with improved instruction on infection prevention and modes of HIV transmission in the clinical setting.

Many students reported being unsatisfied with both teaching methods and access to educational aides such as CDs, videos, computers and internet resources.

Academic Staff

Ten academic staff members from IMTU were interviewed. This small number (only 11% response rate) means that these findings should be viewed as indicative of the situation at IMTU rather than fully representative. Three out of the ten staff had received in-service or short-course training. At least two of the three respondents indicated that their training had covered:

- Clinical manifestations of HIV infections and associated conditions
- HIV/AIDS care and treatment
- PMTCT
- HIV counseling and testing
- Management of HIV/TB co-infection
- Management of STIs

- Palliative care

Two-thirds of the staff interviewed has not received any training on curriculum development, preparation of training materials and use of a variety of student performance assessment methods.

Only four of the 10 reported that they introduce general course objectives at the beginning of the course, and only one indicated that they introduce measurable skills learning objectives at beginning of each session of their course. All IMTU academic staff reported using lectures as a teaching method, and almost all use tutorials and seminars. Coaching was not reported to be used at all, similarly video conferences.

Seven out of the 10 reported that they do not use simulations/anatomic models or video/audio players, mainly because of unavailability. And eight out of 10 are not satisfied with the availability of up-to-date periodicals on HIV/AIDS and access to the internet.

Heads of Department

Eleven heads of department interviewed at IMTU, representing 73% of the department heads. The following skills and knowledge domains were reported as not being part of the curricula in the departments. Further review should be conducted to make sure that these topics are indeed covered.

Table 19 presents selected skills and knowledge domains that the heads of department indicated were not covered in their department’s curricula. For the full list, see Annex 1 and **Annex 2**.

Table 19. Selected skills and knowledge domains not mentioned in head of department interview, IMTU

Knowledge Domains Not Mentioned	Skills Domains Not Mentioned
The role of home-based care in PLWHA	Provide palliative care for AIDS patients
Basic principles of planning HIV/AIDS projects and community	Initiate and coordinate home-based care
Concept of chronic care throughout the life span in management	Conduct patient education on prophylaxis for OIs
Principles of community participation and partnership	
Basic principles of health policy formulation and analysis	
Applied epidemiology and vital statistics information	
Basic principles of research methodology	
Collect, analyze, interpret and disseminate health-related data	

VI. REFERENCES

Crisp N, Gawanas B, Sharp I. Task force for scaling up education and training for health workers. Training the health workforce: scaling up, saving lives. *The Lancet* 2008; 371: 689–91.

Human Resource for Health Strategic Plan 2008–2013, Ministry of Health and Social Welfare, United Republic of Tanzania, January, 2008.

Knebel E, Puttkammer N, Demes A, Devirois R, Prismy M. Developing a competency-based curriculum in HIV for nursing schools in Haiti. *Human Resources for Health*. 2008 Aug 29; 6:17.

Kober K, Van Damme W. Scaling up access to antiretroviral treatment in southern Africa: who will do the job? *The Lancet* 2005; 364: 9428, Pages 103–107.

Koh G, Khoo H, Wong M, Koh D. The effects of problem-based learning during medical school on physician competency: a systematic review. *Canadian Medical Association Journal*. 2008 178(1).

Kohi, T., Portillo, C., Safe, J., Okonsky, J., Nilsson, A., Holzemer, W. The Tanzanian HIV/AIDS Nursing Education (THANE) Pre-service Curriculum. *Journal of the Association of Nurses in AIDS Care*. Article in press.

Mpango wa Maendeleo wa Afya ya Msingi (MMAM) 2007–2017. Ministry of Health and Social Welfare, United Republic of Tanzania. May (2007).

Renggli, V., De Ryck, I., Jacob, S., Yeneneh, H., Sirgu, S., Mpanga Sebuyira, L., Pfitzer, A., Downing, J., Portillo, C., Murray, J., Gove, S., Colebunders, R. HIV education for health care professionals in high-prevalence countries: Time to integrate a pre-service approach into training. *The Lancet*. vol 372 (9635) 26 July 2008–1 August 2008, 341–343.

World Federation for Medical Education. Basic Medical Education: WFME Global Standards for Quality Improvement. (2003). Copenhagen, Denmark.

ANNEX 1. KNOWLEDGE DOMAINS BY SCHOOL AS REPORTED BY HEADS OF DEPARTMENTS

KNOWLEDGE DOMAINS II	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Virologic feature of HIV and immunologic changes that occur	Yes	3	3		1	2	9
	No	3	5	1	4	6	19
The molecular cellular biochemical and physiological changes	Yes	2	4		1	4	11
	No	4	4	1	4	4	17
Natural history of HIV infection	Yes	4	5	1	3	4	17
	No	2	3		2	4	11
Pathological changes that occur in HIV/AIDS	Yes	3	4		3	4	14
	No	3	4	1	2	4	14
Basic principles of HIV-focused history taking and physical	Yes	2	3		2	2	9
	No	4	5	1	3	6	19
WHO criteria for the diagnosis of HIV and clinical staging	Yes	2	5	1	3	2	13
	No	4	3		2	6	15

KNOWLEDGE DOMAINS II	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Basic principles of laboratory diagnosis of HIV/AIDS	Yes	2	5		4	3	14
	No	4	3	1	1	5	14
The basic pharmacology and classification of ART	Yes	2	4			2	8
	No	4	4	1	5	6	20
Eligibility criteria to initiate antiretroviral therapy	Yes	2	4	1	2	1	10
	No	4	4		3	7	18
The basic principles of monitoring patients on ART	Yes	2	2	1	1	2	8
	No	4	6		4	6	20
Basic principles of changing ART	Yes	1	3		1	1	6
	No	5	5	1	4	7	22
Principles of ART adherence	Yes		3	1		1	5
	No	6	5		5	7	23
Pediatric ART	Yes		2		1	1	4
	No	6	6	1	4	7	24

KNOWLEDGE DOMAINS II	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Nutrition for HIV/AIDS patients	Yes	2	3		1	1	7
	No	4	5	1	4	7	21
Post-exposure Prophylaxis (PEP)	Yes	1	4	1	1	2	9
	No	5	4		4	6	19
Basic principles of managing ART side effects and toxicity	Yes	1	3		1		5
	No	5	5	1	4	8	23
Management of opportunistic infections in HIV/AIDS	Yes	2	4		2	2	10
	No	4	4	1	3	6	18
Managing TB/HIV co-infection	Yes	1	3		2	1	7
	No	5	5	1	3	7	21
Basic knowledge on HIV/AIDS in pregnancy	Yes	2	2	1			5
	No	4	6		5	8	23
Basic principles of safe delivery practices for HIV-positive women	Yes	1	2	1	1		5
	No	5	6		4	8	23

KNOWLEDGE DOMAINS II	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Core interventions of prevention of mother to child transmission	Yes	1	2	1	1		5
	No	5	6		4	8	23
Use of ART during pregnancy	Yes		3		1		4
	No	6	5	1	4	8	24
HIV/AIDS prevention	Yes	4	6	1	4	2	17
	No	2	2		1	6	11
Principles of HIV/AIDS infection prevention in clinical settings	Yes		5	1	2	2	10
	No	6	3		3	6	18
Male circumcision	Yes	1	1		1	1	4
	No	5	7	1	4	7	24
Principles of syndromic management of sexually transmitted infections	Yes		2	1		1	4
	No	6	6		5	7	24
Principles of palliative care	Yes		3	1			4
	No	6	5		5	8	24

KNOWLEDGE DOMAINS II	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
The role of home-based care in PLWHA	Yes	1					1
	No	5	8	1	5	8	27
Basic principles of mental health problems in HIV/AIDS	Yes		1				1
	No	6	7	1	5	8	27

KNOWLEDGE DOMAINS III	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Basic principles of health education	Yes	2	3	1	1	1	8
	No	4	5		4	7	20
Basic principles of HIV/AIDS counseling	Yes	1	4		3		8
	No	5	4	1	2	8	20
Basic principles of human behavior related to HIV infection	Yes	2	2	1			5
	No	4	6		5	8	23
The roles and interaction of the physical, economic, socio-culture	Yes	1	3	1	1	1	7
	No	5	5		4	7	21
Knowledge attitudes and practice of community members regarding HIV	Yes	1	3	1			5
	No	5	5		5	8	23
Principles of stigma and discrimination alleviation	Yes	1	2	1			4
	No	5	6		5	8	24
Beneficial and harmful traditional practices of the community	Yes	1	3	1		1	6
	No	5	5		5	7	22

KNOWLEDGE DOMAINS III	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Risk behaviors related to HIV/AIDS infections	Yes	2	2	1	1	1	7
	No	4	6		4	7	21
Awareness on cultural and personal factors that improve	Yes	1	3	1			5
	No	5	5		5	8	23
The role of gender consideration in HIV/AIDS health education	Yes	1	2				3
	No	5	6	1	5	8	25

ANNEX 2.
SKILLS DOMAINS BY SCHOOL
AS REPORTED BY HEADS OF DEPARTMENTS

	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Take an appropriate history including social issues and HIV	Yes	2	4	1	2	1	10
	No	4	4		3	7	18
Perform physical examination and assess mental status in HIV	Yes		3		2	1	6
	No	6	5	1	3	7	22
Perform and interpret HIV laboratory results	Yes		2		2	2	6
	No	6	6	1	3	6	22
Apply WHO criteria for diagnosis and staging	Yes	2	1	1	2	2	8
	No	4	7		3	6	20
Initiate first line ART regimen according to national guidelines	Yes	1	4		1	1	7
	No	5	4	1	4	7	21
Monitor patients on ART identify and manage ART side effects	Yes	1	1	1	1	1	5
	No	5	7		4	7	23

	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Perform clinical and laboratory monitoring of patients on ART	Yes		2		1	1	4
	No	6	6	1	4	7	24
Initiate second line regimens when needed and manage treatment	Yes		3		1	1	5
	No	6	5	1	4	7	23
Screen manage and prevent opportunistic infections	Yes	1	4		1	2	8
	No	5	4	1	4	6	20
Recognize immediate life-threatening conditions and medical emergencies for HIV positive people	Yes		2			2	4
	No	6	6	1	5	6	24
Provide post-exposure prophylaxis for occupational exposure	Yes		4	1	1	2	8
	No	6	4		4	6	20
Conduct HIV test and interpret test results	Yes	2	3	1	3	1	10
	No	4	5		2	7	18
Primary education of couples and provision of family planning	Yes	1	1	1			3
	No	5	7		5	8	25

	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Provide focused antenatal care and conduct safer obstetric practices for HIV-positive women	Yes	1	1		1		3
	No	5	7	1	4	8	25
Provide short-courses antiretroviral prophylaxis	Yes	1	1		1	1	4
	No	5	7	1	4	7	24
Discuss and demonstrate infant feeding options for HIV-positive clients	Yes		1	1	1		3
	No	6	7		4	8	25
Refer HIV patients to community care and support groups	Yes		1		1		2
	No	6	7	1	4	8	26
Manage TB/HIV co-infection	Yes	1	3	1	1		6
	No	5	5		4	8	22
Demonstrate infection prevention principle in clinical settings	Yes		2		1	1	4
	No	6	6	1	4	7	24
Diagnose and manage STIS using syndromic approach	Yes		1	1			2
	No	6	7		5	8	26

	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Provide palliative care for AIDS patients	Yes	1	1	1	1		4
	No	5	7		4	8	24
Initiate and coordinate home-based care	Yes			1			1
	No	6	8		5	8	27
Refer patients to higher level of clinical care and community services	Yes	1	1	1	1		4
	No	5	7		4	8	24

SKILL DOMAINS III	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Conduct effective health education on HIV/AIDS-related issues	Yes	1	3	1		1	6
	No	5	5		5	7	22
Conduct provider initiated testing and counseling (PITC)	Yes	1	1		1	1	4
	No	5	7	1	4	7	24
Provide HIV/AIDS pre-test and post test counseling	Yes	1	3		1	1	6
	No	5	5	1	4	7	22

SKILL DOMAINS III	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Provide FP counseling in relation to HIV/AIDS infection	Yes	1	3	1			5
	No	5	5		5	8	23
Provide counseling for pregnant mothers on prevention of mother to child transmission	Yes	1	1	1	1		4
	No	5	7		4	8	24
Provide infant feeding counseling in relation to HIV/AIDS	Yes	1	2	1	2	1	7
	No	5	6		3	7	21
Provide ART adherence counseling	Yes		2		1		3
	No	6	6	1	4	8	25
Provide nutritional counseling in patients with HIV/AIDS	Yes		2		1		3
	No	6	6	1	4	8	25
Conduct patient education on prophylaxis for OIs	Yes			1			1
	No	6	8		5	8	27

SKILL DOMAINS III	ANSWER	UNIVERSITY					TOTAL
		HKMU	IMTU	KCM COLLEGE	MUHAS	WBUCHS	
Effective communication with patients and their families on	Yes	1	4	1	1		7
	No	5	4		4	8	21
Effective communication with other health care providers	Yes		3		1		4
	No	6	5	1	4	8	24