QUALITY STANDARDS IN PROVISION OF FACILITY BASED HIV CARE AND TREATMENT: A CASE STUDY FROM DAR ES SALAAM REGION, TANZANIA

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Abstract

Objective: A cross-sectional descriptive study was conducted to assess the quality standards of health facilities providing antiretroviral treatment (ART) in Dar es Salaam from May to July 2005.

Methods: All ten health facilities (both public and private) already designated by Ministry of Health (MOH) to provide ART, six of them since October 2004 and four since May 2005, were included in the study purposively. The other two not designated were randomly picked and added. A checklist with the MOH required standards was used to assess the availability of infrastructure (equipment and staff) for provision of ART, and noted the number of patient eligible, started on ART and their follow ups.

Results: The study findings indicated that there were inadequate trained personnel, inadequate laboratory equipments, inadequate antiretroviral drugs and isoniazed was under utilized. There were inadequate confidential places for counseling and information system was weak. Not all the eligible patients were able to start ART and comprehensive HIV care and treatment was not provided in all the designated facilities.

Conclusion: Quality standards for providing ART in eligible health facilities in Dar es Salaam varied from facility to facility with better quality standards in facilities that were designated earlier than those designated later indicating a potential for improvement in future. However fast Improvement in staff training, infrastructure, equipment and drugs supplies, health management information system is needed if we are to treat estimated more than 400,00 HIV/AIDS patients by the year 2010.

Key words: HIV Care and treatment, Facility based care, Case study, Quality standards, program evaluation, Africa.

Introduction

The major urgent public health problem that the world is facing today is Human Immunodeficiency Virus or Acquired Immunodeficiency Syndrome (HIV/AIDS). The introduction of Highly Active Antiretrovirals (HAART) provided HIV/AIDS patients with opportunities for quality of life improvement by stopping or inhibiting the replication of human immunodeficiency virus, HIV[1]. By 2003, WHO had declared that the lack of access to HIV treatment was a global health emergency and calls for unprecedented action to ensure that by the end of 2005 at least 3 million people in need of Anti-Retroviral Therapy (ART) will have access to it. It was reported that, fewer than 5% of people in developing countries who need antiretrovirals could access the medicine in question[2].

Scaling up of AIDS treatment in developing countries is faced with a lot of challenges including; limited quality standards of health system to provide treatment, in terms of human resource, infrastructure needed to deliver ART, lack of data, and lack of adequate drug management system to ensure adequate supplies of antiretroviral drugs[3-5]

In applying the concept of quality assurance in a health system, the term “structure” has been used to mean the conditions under which care is provided e.g. premises, equipment, staff etc, while “process” means the activities that constitute the patient-provider interaction including diagnosis, treatment and prevention activities etc. The “outcome” is taken to mean changes at the individual or population levels that can be attributed to health care, whether desirable or undesirable e.g. morbidity, mortality, satisfaction etc [6]

A certain level of quality of care is required as a standard for delivering antiretroviral therapy [2, 3, 7]. The care and treatment unit has developed an accreditation process to identify facilities as potential ART providers and to manage the strengthening process in delivering ART. The following indicators are being used as minimum criteria to start or expand antiretroviral therapy: Organization of HIV/AIDS care within the facility; availability of human resource, training and guidelines; Clinical HIV/AIDS care and treatment services; Patients records and reporting system; Community preparedness for HIV/AIDS care and treatment; Continuum of care; Voluntary Counselling and Testing; Laboratory and Pharmacy services [8]

Since the scaling-up program in Tanzania is still in its initial stages, very little is known on the quality of care provided at the newly designated health facilities in implementing the ART programmes. The aim of this study was therefore to determine the quality standards of health facilities in providing HIV/AIDS care and treatment in line with MOH stipulated guidelines. Specifically we assessed the availability of trained personnel in providing antiretroviral therapy, availability of equipments, drugs and guidelines in providing antiretroviral therapy. We also assessed the adequacy of HIV/AIDS services (e.g Voluntary Counselling and Testing (VCT), OI, prevention of maternal to child transmission (PMTCT), home based care (HBC), and antiretroviral (ART) provision) then availability of health facility recording and reporting system for HIV/AIDS management and lastly the percentage of patients who are already counselled and are on continuous antiretroviral treatment.

Methods

Study area:

The study was conducted in Dar es Salaam region, which is the largest city in Tanzania and the main business center in the country. The Dar es Salaam region is located on
HIV/AIDS was reported that about 11% of adult were infected with estimated population of Dar es Salaam according to national Sample size and sampling

Subjects:

A cross sectional descriptive study, using both quantitative (checklist) and qualitative (indepth interviews) were used to collect information, on quality standards for provision of ART in health facilities providing ART in Dar es Salaam, from May to July 2005. According to MOH guidelines provision of ART requires a facility to be able to provide laboratory investigations; hence this study considered all non-dispensary health facility (i.e health centres and hospitals) to be eligible. Using the above criterion for inclusion, the number of eligible facilities for providing ART in Dar es Salaam were 40 that include 5 hospitals and 5 health centres public owned institutions , and 17 hospitals and 13 health centres owned by private/voluntary institutions (compiled from City Medical Officer of Health).

Sample size and sampling

All ten health facilities (both public and private) already designated by MOH to provide ART, six of them since October 2004 and four since May 2005, were included in the study purposively. The first six include; Pastoral Activities and Services for people with HIV/AIDS in Dar es Salaam Archdiocese (PASADA), Muhimbili National Hospital (MNH), Municipal hospitals (Amana, Mwananyamala and Temeke), and Lugalo military hospital . The other four designate since May 2005 include; Aghakan hospital, St Bernard hospital, Mount Ukombozi hospital, and Tanzania Occupational Health (TOH) hospital. Additionally, two health facilities, which were not designated by MOH but were also providing ART, i.e Kigamboni health centre and University of Dar es Salaam health centre (UDSM) were included randomly to make a study sample of 12 health facilities. This was to fulfil the recommended sample size of 25-30% of eligible health facility when assessing quality standards[9], and hence a sample of 12 health facilities was considered adequate to explore quality aspects of provision of ART in Dar es Salaam.

Data collection technique and procedure

Data collection was done by the first author and assisted by two nurse officers after being trained in data collection techniques. A pretest of the data collecting tools was done in one health facility that was not included in the study, to check on the relevance of data collection instrument after which the data collection tools were refined. An introductory meeting was held on the first day in each institution to familiarise with the staff, explain the aim of the study and seeking their cooperation. It was emphasised that the research team was not representing the Ministry of Health and that the findings of this study would not be used against any of them. A checklist was used to observe the availability of equipments, drugs, guidelines and human resources. It was also used to guide interview with the appropriate personnel member of the studied health facilities. The minimum set of standards to initiate antiretroviral and key indicators in the treatment of HIV/AIDS as recommended by MOH, was included in the checklist [8]

The qualitative information concerning health facility was collected by the first author interviewing all administrators and in-charge of the selected facilities on information concerning health facility, human resources and training. The in-charge of clinical services for ART program also provided information on HIV/AIDS care and treatment services and on Health Information System. Laboratory in-charge provided information on laboratory equipment and services and the Pharmacist in-charge provided information on drugs and pharmacy service.

Data management and analysis

Quantitative data from the field was coded by the first author, entered in a computer, and then processed using EPI-Info 6. The ethical clearance was obtained from Muhimbili University College of health sciences, Directorate of Research and Publication, while permission to conduct the study was granted by Regional and respective Municipal authorities. At the level of health facilities, all the in charge and administrators of the selected health facility were informed of the study and all of them fortunately concerted to participate in the study voluntarily.

Result

Human Resource and Training

Using a minimum recommended criterion for health workers among the 6 facilities designated to provide ART in 2004, generally high percentage of the facilities had personnel for delivering antiretroviral therapy as recommended. However, one third (2/6) of Health Facilities did not have social workers, and two thirds (4/6) did not have data clerk. Similarly for those facilities that were designated from May 2005, most carders met the recommended minimum criteria but all the health facilities were lacking social workers and data clerks. St Bernard and TOH hospitals had higher number of personnel compared to Aghakan hospital and University of Dar es salaam health centre. Although two facilities included in the study were not designated to deliver ART both had medical personnel, nurse personnel, and laboratory personnel to meet the minimum criteria. However, both the facilities did not have social workers and data clerks. Additionally, one of the facilities did not have pharmacy personnel (table 1). We also found that for the facilities designated to provide ART since October 2005 not all personnel had attended training.
In Amana, MNH, PASADA, and Temeke hospitals, all personnel providing HIV care and treatment were trained. However, not all personnel trained in Mwananyamala (70%) and Lugalo (79%) hospitals were trained. Also half (2) of the health facilities designated in May 2005 had all personnel trained to provide HIV/AIDS care and treatment. However, the percentage of personnel trained varied from 18.2% in St Bernard to 44% in TOH (Table 2). The two health facilities that were not designated, Kigamboni Health Centre had only 18.4% of personnel trained on HIV care and treatment and Mount Ukombozi hospital had no personnel trained on HIV care and treatment.

Table 1: Human resource for HIV care and treatment in health facilities designated by MOH to provide ART since October 2004, May 2005 and those not designated.

<table>
<thead>
<tr>
<th>Category</th>
<th>Health Facility designated to provide ART</th>
<th>Not designated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Since October 2004</td>
<td>Since May – 2005</td>
</tr>
<tr>
<td>Category</td>
<td>F1</td>
<td>F2</td>
</tr>
<tr>
<td>Medical personnel (Specialist, MO, AMO, CO)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Nurse personnel (NO, NM)</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Pharmacy personnel (Pharmacist, Pharmaceutical Tech)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Laboratory personnel (Technologist, technician)</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Social workers</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Data clerk</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Key: F1= Amana, F2= Lugalo, F3= Muhimbili, F4= PASADA, F5= Temeke, F6= Mwananyamala, F7= Aga khan, F8= UDSM, F9= St. Benard, F10= TOH, F11= Kigamboni, F12= Mt Ukombozi, MC= Minimum Criteria, AMO = Assistant Medical Officer, MO = Medical Officer, CO = Clinical Officer, NO = Nurse Officer, NMW = Nurse midwives

Availability of Guidelines, Equipments and Drugs

Availability of drugs

The availability of first line antiretroviral drugs in studied health facilities ranged from 4 (33.3%) health facilities e.g. Zidovudine drug to 11 (91.7%) of health facilities e.g. Triomune 40 drug. Most of health facilities did not have second line regimen. Drugs like Nelfinavir 250mg and Nelfinavir 50mg/ml were lacking in all studied health facilities. Only one health facility stocked Didanosine 25mg, Didanosine 100mg, Didanosine 2mg/ml powder, Abacavir 300mg, Abacavir 20mg/ml, Kaletra and Indinavir. The Ritonavir 100mg and Saquinavir were found in two of the studied health facilities.

Availability of equipment

Figure 1 shows that (91.7%) of facilities had Rapid test kit for HIV testing and QBC equipment for blood count. More than half of facilities surveyed did not have FACSCount/FACSClibur machine for CD4 cell count. Incinerator which is necessary for hospital waste disposal were found in two third (66.7%) of the facilities. All Health Facilities did not have Rocking Platform instrument for Western Blot test and equipment for viral load test. Also only (33.3%) of the facilities had equipment for ELISA test.

Figure 1. Percentage of health facilities with essential equipment for provision of ART.
Availability of guidelines

About 91.7% of the facilities had the National guidelines on PMTCT and Voluntary Testing and Counselling, 83.3% had guidelines on Laboratory services, ART treatment, tuberculosis (TB) control, sexual transmitted infections (STI) management procedure, and occupational exposure to HIV/AIDS. Further more 75% of the studied health facilities had guidelines on Pharmacy services, Home Based Care and HIV/AIDS Surveillance. About 58.3% had guidelines on monitoring adverse drug reactions. Guideline on disposal of expired drugs was not available in all the health facilities.

Services Provided

HIV Care and Treatment services

Figure 2 show that all the health facilities had STI, VCT and TB services. About 83.3% of the facilities delivered antiretroviral therapy; 66.7% of the facilities provided PMTCT services. It was noted that only 41.7% of the facility provided Home Based Care services and 8.3% nutrition services. Nearly all facilities (91.7%) were providing cotrimoxazole as prophylaxis for opportunistic infections. But it was found that only one Facility was providing Isoniazid drug for TB prophylaxis.

Seventy five percent (75%) of the surveyed facilities used WHO stages and CD4 cell count as the criteria for starting antiretroviral therapy. All ten-health facilities, which were designated to deliver antiretroviral therapy, used an eligibility protocol before starting antiretroviral therapy. All the facilities performed CD4 count, Full blood picture (FBP), Liver function and kidney function tests before initiating antiretrovirals. However, no health facility performed viral load test before initiating ART.

<table>
<thead>
<tr>
<th>Name of the health facility</th>
<th>Designated since March 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amana</td>
<td>18</td>
</tr>
<tr>
<td>Lugalo</td>
<td>47</td>
</tr>
<tr>
<td>Muhimbili</td>
<td>39</td>
</tr>
<tr>
<td>Mwananyamala</td>
<td>20</td>
</tr>
<tr>
<td>PASADA</td>
<td>42</td>
</tr>
<tr>
<td>Temeke</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>Percentage</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: Percentage of personnel trained to provide HIV care and treatment in all the study health facilities

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About 83.3% of facilities monitored patients who were on ART at an interval of two weeks after initiating their therapy and 16.7% of facilities were on stage of monitor in monthly interval. One quarter of the facilities had no adequate rooms for consultation and counselling patients with HIV/AIDS hence confidentiality was not observed. Counselling was conducted in an open place where other client’s wait and health workers pass all the time. Clients and counsellors talk in low voice so that other people could not hear them. The three Municipal hospitals and PASADA had adequate rooms for consultation and counselling.

Pharmacy services

In assessing the essential pharmaceutical activities or services in delivering antiretroviral therapy, it was noted that two thirds (66.7%) had proper place for the storage of drugs and 58.3% of the facilities had a suitable confidential place for counselling patients on the use and adherence of antiretrovirals. Amana municipal hospital and PASADA had big and suitable confidential places. In 41.7% of the health facilities there were no rooms for this purpose. In MNH and Mwananyamala Hospital, the HIV/AIDS patients took their medicines over the counter. Though it was also found that almost all facilities (91.7%) counselled patients on the use of antiretrovirals, however, in most health facilities the procedure was not done in the dispensing area. Two of the health facilities, which were designated to deliver antiretrovirals, did not have a refrigerator. Antiretrovirals, which needed refrigeration, were kept in a fridge found in the laboratory. Additionally, it was found that, there was no working air conditioner in two of the health facilities.

Laboratory services

Most of the facilities (80 to 100%) were able to conduct HIV rapid tests, Liver function, kidney function, VDRL, Sputum smear, FBP and Pregnancy tests. Facilities were less able to perform both CD4 cell count (41.7%) and ELISA tests (16.7%). Many facilities, which did not perform CD4, cell count, reported to send the blood sample to MNH.
The three Municipal hospitals also had FACSount/FACSClibur (CD4 cell count). Temeke and Amana hospitals were already performing CD4 cell count while Mwananyamala hospital was expected to start soon. In all twelve assessed facilities the following tests were not available: Viral load tests, Drug resistance tests, HIV PCR tests and Rocking Platform for Western Blot.

Results of HIV testing were available the same day for two thirds (66.7%) of the facilities. Other 8.3% health facilities reported to give results in the next day, and 16.7% within a week. Reasons of delaying results varied among Health Facilities. MNH did not give results immediately because the laboratory was relatively busy with a lot of tests while PASADA had to prepare patients before giving them the result.

Recording and Reporting System

Nearly all the facilities (91.7%) had clinical records for all patients. About 75% of health facilities were using MOH clinical AIDS surveillance form. Three quarter of the facilities (75%) had a system of recording number of patients who are on antiretroviral therapy. In recording number of patients who are on antiretroviral treatment different methods were used some of the facilities used names and other numbers. For example the Municipal hospitals used identification numbers to record patients who were on treatment. Every month about 83.3% of the facilities sent data to NACP and 50% to DMO’s office. In addition, the Municipal hospitals send data every day to the HIV/AIDS care and treatment program, which collaborated with Muhimbili University of Health Science, Dar es Salaam City Council and Harvard School of Public Health (MDH).

Patients on ART Treatment

It is encouraging that all health facilities in this study, which delivered antiretroviral therapy, used triple therapy regimen as recommended. Not all surveyed facilities were able to give information about patients who were on ART. Therefore, the data on table 3 and 4 did not include all twelve studied health facilities.

Table 3. Shows the number of HIV/AIDS patients registered at the facility and percentage of HIV/AIDS patients who were on ART treatment. The number of HIV/AIDS patients registered in the studied health facilities was between 2 and 14,000. The number of HIV/AIDS patients who were on ART treatment ranged from 1.7% to 100%. Kigamboni health centre had about 46 sero-positive patients, but did not give ART treatment. At UDSM health centre only two patients were registered, and all of them were on ART. Number of HIV/AIDS patients registered at PASADA voluntary agency was highest (14,000). However, only 1.7% HIV/AIDS patients registered in at PASADA was required to be on ART treatment.

Further more Table 3 shows the variation of patients who were eligible to start antiretrovirals in different health facilities. The study revealed that there is a big difference between facilities on proportion of patients who were eligible to start antiretrovirals. About 1.7% of patients in PASADA were eligible to start antiretrovirals; however, in other health facilities eligibility ranged from 53.1% to 75.7%.

The three Municipal hospitals (Temeke, Amana, Mwananyamala) had large number of patients who were eligible to start antiretrovirals but the drugs were not enough. All eligible HIV/AIDS patients at PASADA Voluntary Agency and 97% of eligible patients at Lugalo hospital were on ART. The percentage of patients who were lost for follow-up for more than three months ranged from 0 to 7.3% as shown in Table 3. PASADA, which had a good Home Based Care program, had no patients who had been lost for follow up. Further the study shows that, the
percentage of HIV/AIDS patients who had died on ART ranges from 0.13% to 7.7% as presented on table 4. All private facilities were not able to provide data.

Table 4: Percentage of patients died on ART in different health facility

<table>
<thead>
<tr>
<th>Name of Facility</th>
<th>Total</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temeke hospital</td>
<td>332</td>
<td>22</td>
<td>6.6%</td>
</tr>
<tr>
<td>Lugalo hospital</td>
<td>437</td>
<td>32</td>
<td>7.3%</td>
</tr>
<tr>
<td>Amana hospital</td>
<td>460</td>
<td>14</td>
<td>3.0%</td>
</tr>
<tr>
<td>Mwananyamala hospital</td>
<td>444</td>
<td>34</td>
<td>7.7%</td>
</tr>
<tr>
<td>Muhimbili hospital</td>
<td>2223</td>
<td>3</td>
<td>0.13%</td>
</tr>
<tr>
<td>PASADA</td>
<td>240</td>
<td>9</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

**Discussion**

Except for data clerks, all health facilities designated by the MOH to deliver ART had health care workers according to the MOH minimum criteria. However, the minimum standard set by MOH does not reflect the real situation or demand on the ground. For example the patients registered at Temeke, Mwananyamala, Amana, Lugalo, Muhimbili, and PASADA health facilities, varied from 615 to 14000 per health facility; this indicated differential demand for health personnel despite following the same criterion. The use of National standards has been recommended to be interpreted with care based on local situation[10].

In supporting to the unmet need for a minimum criteria it has been reported that although there were adequate human resources allocated for health care provision in Tanzania according to national standards, there was low availability of health professionals [11].

Other reports[12]and the MOH guidelines recommended that the minimum criteria for health facilities to be accredited should be to have a dedicated care and treatment team, which has been trained according to the approved national curricula [8]. However this study found that not all designated facilities had met these criteria before they started providing ART and only few health workers were trained in the facilities that were not designated to deliver ART.

Availability of equipments is an important critical component of the health system that needs to be strengthened to provide ART widely. Unfortunately this study found that there was lack of laboratory equipments in some of the studied facilities, as exemplified by lack of CD4 cell count, western blot and ELISA tests. The MOH recommends CD4 cell count and Enzyme Linked Immunosorbant Assay (ELISA) equipment as minimum criteria to start antiretrovirals for the regional and referral hospitals [8]. However, the study found that not all facilities fulfill these criteria. Lack of technology to perform drug resistance test in all the studied facilities also confirm existing gap in these findings. The findings are similar to the one reported in the Northern zone of Tanzania, where there was lack of laboratory quality standards and capability to manage HIV care and treatment [13].

The availability of antiretrovirals for the scaling-up program is critical. It is recommended that ART programs must have a zero stock out policy, because the risk of stock outs carries such important public health implications[14]. In this study, although all the designated facilities had the first line regimen, the stock was not available for new patients. It was found that about 593 HIV/AIDS patients were waiting for ART in the three Municipal hospitals.

Although the MOH recommends Saquinavir, Ritonavir and Abacavir as an alternative to Efavarenz in TB and HIV co-infection, the study found that Saquinavir, Ritonavir, and Abacavir are scarce commodities in our health facilities.

The MOH recommends that, if clinical assessment indicated the presence of treatment failure due to a confirmed drug resistance then the best approach is to switch from the first line combination to a completely second line regimen. However, in this study the second line regimen was lacking. In consistent to this finding, Medicines Sans Frontiers (MSF) reported that the challenge in ART treatment include the lack of affordable second-line drugs[15].

Storage requirement for ART was not fulfilled in some of the designated facilities. Some of the studied facilities lacked adequate space for the storage of drugs and there were no working air conditioner and refrigerators. Adequate space for storage and appropriate temperature are some of the MOH criteria for provision of services. Inappropriate storage of antiretrovirals might reduce drug efficacy.

The lack of confidential counseling space as was noted in more than 40% of studied facilities, may lead to inadequate drug counseling and hence poor drug management. This is in contrary to WHO recommendation that all programs must have a suitable space for drug counseling[16].

Although WHO, other international organizations, and MOH recommend a comprehensive HIV care and treatment in providing antiretrovirals, this study found that integrated services were not established in most of the studied facilities. Only three comprehensive services were fulfilled in all studied facilities. These were TB services, STI and Voluntary Counselling and testing.

Most of the private Health facilities were less responsible for the prevention of Mother to child transmission (PMTC) and Home based care (HBC) services. It is reported that the availability of PMTCT services in the health facilities would increase the uptake of VCT in a synergistic fashion[17]. It is also a crucial point for the introduction of antiretroviral treatment for the mother and the family when indicated. MOH recommends that, health care workers should conduct supervisory visits to communities and home care providers as part of their role and responsibility to ensure the continuum of care[8].

Provision of comprehensive services is highly recommended and food support is one of its elements[17]. Although MOH and international agencies recommends basic support such as food, as part of continuum of care, it
was only PASADA facility that was able to provide nutrition services.

Furthermore, in this study it was found that one quarter of the facilities did not have adequate rooms for consultation and counseling patients with HIV/AIDS. Adherence counseling and support should take place in a suitable private place to assist patient confidentiality[8]. Counseling should be conducted in an area where visual and auditory privacy are provided.

The process of monitoring quality includes collecting data, analyzing them and reporting the results [3]. The study results show that, most of the studied health facilities had records for the number of HIV/AIDS patients. However, the information of the HIV patients and their treatment were not available in all of the studied facilities and this can affect monitoring. Research evidence shows that AIDS case data are characterized by underreporting[18]. The study found that the private health facilities were less responsible for data collection. Gilks reported that, the problem at the moment is that the majority of treatment delivery is through the private sector. However this study found out that there was no accountability in the private sector and no service quality monitoring, besides, there is no national system for counting the numbers of people on treatment [19]

Conclusion and Recommendations

It was concluded that the quality standards of health facilities to provide antiretroviral therapy varies from facility to facility and can be improved as it was proved by the quality standards of those facilities designated in 2004 compared to those of 2005.

To be able to treat more than 400,000 HIV/AIDS patients in the next five years it need more emphasis on personnel training, improvement of infrastructure, strengthening health management information system (HMIS), to enhance adequate equipments and drugs, if we are to achieve millennium development goal for HIV/AIDS. More studies are recommended to assess the effect of ART on the quality and economic life of HIV/AIDS patients

Acknowledgement

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