

Providing universal access to antiretroviral therapy in Thyolo, Malawi through task shifting and decentralization of HIV/AIDS care

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Summary

OBJECTIVE To describe how district-wide access to HIV/AIDS care was achieved and maintained in Thyolo District, Malawi.

METHOD In mid-2003, the Ministry of Health and Médecins Sans Frontières developed a model of care for Thyolo district (population 587 455) based on decentralization of care to health centres and community sites and task shifting.

RESULTS After delegating HIV testing and counseling to lay counsellors, uptake of testing increased from 1300 tests per month in 2003 to 6500 in 2009. Shifting responsibility for antiretroviral therapy (ART) initiations to non-physician clinicians almost doubled ART enrolment, with a majority of initiations performed in peripheral health centres. By the end 2009, 23 261 people had initiated ART of whom 11 042 received ART care at health-centre level. By the end of 2007, the universal access targets were achieved, with nearly 9000 patients alive and on ART. The average annual cost for achieving these targets was €2.6 per inhabitant/year.

CONCLUSION The Thyolo programme has demonstrated the feasibility of district-wide access to ART in a setting with limited resources for health. Expansion and decentralization of HIV/AIDS service-capacity to the primary care level, combined with task shifting, resulted in increased access to HIV services with good programme outcomes despite staff shortages.

keywords universal access, task shifting, human resources, antiretroviral therapy scale-up, decentralization, Malawi

Introduction

Malawi (population 13 million) is a small, very poor country with an adult HIV prevalence estimated at 12% (Ministry of Health 2008). Despite a dire shortage of health workers and a high level of poverty [per capita Gross Domestic Product (GDP) is \$US596], the government of Malawi has made tremendous efforts to scale up HIV care and treatment (Nkandu *et al.* 2005, National AIDS Commission, 2010). The country embarked on a national scale-up of antiretroviral therapy (ART) in 2004, at a time when an estimated 170 000 people were in need of treatment (Libamba *et al.* 2007). A model of care was developed that relied on non-

physician clinicians, nurses and lay workers to deliver ART, and this public health approach has enabled 271 105 people to have started ART via 377 facilities as of end 2009 (Ministry of Health 2009), among whom 198 846 (73%) were alive and on ART. This represented almost two-thirds of the need (306 000 people) (Ministry of Health 2008), putting Malawi ahead of other countries in the region in terms of ART coverage. South Africa for example had a GDP per capita more than 16 times that of Malawi, yet ART coverage in 2009 was substantially lower, estimated at just 40% (Adam & Johnson 2009).

Médecins Sans Frontières (MSF) has been supporting HIV/AIDS care in Thyolo, a rural district in southern

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Malawi, since 1997. Thyolo District (population 587 455), (National Statistic Office 2008) is one of the country's poorest districts, with a poverty rate of 64%, compared to a national average of 52% (World Bank 2006). With an adult HIV prevalence of 21%, it also has one of the highest rates of HIV infection in the country (National Statistics Office 2004).

In mid-2003, the Ministry of Health (MoH) and MSF set out to develop a model of care that would be feasible in a rural, impoverished district with high staff shortages like Thyolo. In this paper, we describe the essential elements of the model of care developed in Thyolo, to achieve universal access to ART and provide operational evidence to support the safety and effectiveness of task shifting.

Programme innovations to support universal access to treatment

A number of innovative approaches enabled this rapid scale-up, including task shifting to increase the number of health workers engaged in HIV care and improve efficiency; decentralization of care to health centres and community sites to spread the workload across multiple sites and increase access; simplification of protocols for testing and treatment; community engagement to increase capacity and support programme sustainability; and strengthening the health system. These different approaches are outlined below.

Task shifting

Malawi has faced a considerable loss of health workers, mainly because of employment opportunities in other countries and loss of staff because of HIV/AIDS (Harries *et al.* 2002). At the end of 2007, the national Human Resources for Health census reported that there were only 159 doctors (1/100 000 pop) and 3614 nurses/midwives/nurse-technicians (26/100 000 pop) in the country. These rates are among the lowest in the region (Ministry of Health 2007). Primary health facilities in rural areas are generally staffed by nurses and medical assistants, a cadre of non-physician clinicians with basic 2-year training. Only 32% of health centres in Malawi fulfil the agreed staffing norms described in the Essential Health Package of two nurses/midwives and one medical assistant or clinical officer. Table 1 summarizes the main cadres providing HIV/AIDS care in Thyolo district.

On average, 1.1 Full Time Equivalent (FTE) clinical officers or medical assistants and 1.24 FTE nurses and 1.2 FTE clerks provide ART care for approximately 1000 patients on ART in the country (Ministry of Health 2009).

In Thyolo District Hospital, between 2005 and 2007, the total number of staff per 1000 patients on ART was calculated to be approximately four FTEs (1.4 clinical staff, 0.25 pharmacy staff, 0.8 counsellors and 1.5 non-medical staff). These figures are all far below the minimum of seven FTEs per 1000 patients on ART recommended by WHO (Hirschhorn *et al.* 2006).

Because of these critical human resource shortages, 'task shifting' has been promoted as an essential component of ART scale-up to overcome the shortage of doctors and other essential health staff in the country (World Health Organization 2008). Task shifting entails the delegation of certain medical responsibilities to less specialized health workers. The effectiveness of such delegation has since been supported by a number of studies from Malawi (Ferradini *et al.* 2006) and elsewhere in southern Africa (Callaghan *et al.* 2010). Examples of task shifting applied in Thyolo are summarized in Table 2.

As only one in five medical doctors work in district hospitals (Ministry of Health 2007), Ministry of Health guidelines allow non-physician clinicians and nurses to initiate ART. ART skills are transferred during a 1-week classroom training course, combined with a 2-week clinical attachment in an experienced ART site. Successful participants receive a certificate of competence. Clinical supervision by a team of experienced clinicians takes place regularly.

In April 2003, initiation of patients on ART started at the district hospital, mainly by clinical officers. Task shifting ART care from clinical officers to medical assistants took place soon after, resulting in the possibility to decentralize ART initiations to health centres. In 2007, the policy was further revised to allow nurses to start patients on ART.

Health Surveillance Assistants (HSAs) have played a crucial role in the decentralized district health system. This cadre was initially created as a community cadre responsible for preventive activities and organizing disease outbreak response. HSAs follow a 10-week basic training and their numbers can therefore be increased relatively rapidly and at low cost. After an increase in training of HSAs in 2007, coverage of HSAs rose from 5040 in 2006 to 11 000 in 2007 with almost approximately one HSA per 1200 population today.

Another important adaptation was the shifting of HIV testing and counseling (HTC) from nurses to trained HSA counsellors. After undergoing a 3-week formal training, HSA counsellors are certified by the MoH to conduct HTC. Remuneration remains at the same level as for other HSAs. These HSA counsellors currently spend several days per week at the health facility providing HTC services. More than 2000 HSA counsellors are now

Table 1 Main health staff cadres in Malawi and staffing levels in Thyolo

Cadre	Duration of education	Responsibilities and location	Vacancies in Thyolo District		
			Current numbers (end 2009)	MoH establishment	Vacancy (%)
Medical Doctor (MD) MBBS Degree	Six and half-year course, including 18 months internship	Mainly based at hospital level.	2	6	76
Clinical Officer (CO) Diploma in Clinical Medicine	Four-year course, incl 1 year internship	Mainly at (district) hospital level. In absence of MDs, they have wider responsibilities including surgery and treatment of complicated cases.	18	88	80
Medical Assistant (MA) Certificate in Clinical Medicine	Two-year course, incl 3-4 months practicals	Main cadre providing care at health centre level.	30	70	57
Registered Nurse (RN)	Four-year course	Degree course including 1 year of midwifery. Usually based at hospital level.	92	496	82
Nurse-Midwife Technician (NMT)	Three-year course (diploma)	Deployed to hospitals and health centres.			
Nurse Technicians (NT)	Two-year course but 12 years of schooling as entry criteria.	Previously known as enrolled nurses, historically the basic nursing training.			
Health Surveillance Assistant (HSA)	10 week basic training	Deliver Essential Health Package at community level. Often partially working at health facility level.	501	560	11

Data from GTZ/Malawi Health SWAP Donor Group (2007).

engaged in HTC activities (National AIDS Commission 2010).

Health service adaptations

At Thyolo District Hospital, patients are triaged by a nurse and directed to different health providers according to their clinical status and duration on ART. Patients with complications enter the 'slow track' and receive comprehensive care and treatment from an experienced clinician (medical assistant or clinical officer); new patients and those with relatively mild problems are managed by a clinician in the 'medium track'; stable patients (defined as those on ART for more than 2 months and without clinical complications) are followed up in the 'fast track' and seen by a nurse. The average number of consultations per health care provider is 210/month for the slow track, 680/month for the medium track and 2100/month for the fast track. An average fast track consultation takes approximately 10 min, while a visit in the slow track by a clinician takes between 20 and 30 min. As a result of these service

adaptations, the number of patients enrolled onto ART treatment almost doubled from 130 to 250 patients per month in the hospital, and the median time in starting ART for eligible patients fell from 98 days in 2003 to less than 20 days in 2009. A similar model of patient management is in operation at the health centres.

Prior to the introduction of ART in 2003, considerable numbers of patients were bedridden, receiving palliative care and other basic support from community home-based care givers (nurses and volunteers). In addition, efforts of these community care givers included HIV/AIDS awareness campaigns and prevention activities such as condom distribution. A number of activities made use of support groups formed by HIV-positive people at community level. The contribution of these support structures intensified with the introduction of ART as support groups started encouraging early treatment-seeking behaviour and long-term adherence to treatment. Studies have shown that community support can lead to better adherence (Weidle *et al.* 2006), higher retention in care (Torpey *et al.* 2008) and increased survival (Zachariah *et al.* 2007). At the end

Table 2 Traditional and 'task-shifted' roles of health staff at different service levels

Task	Past	Current	Proposed
Hospital			
HTC	Nurse	HSA Counsellor	HSA Counsellor and PLWHA
ART/OI care	Medical Doctor and Clinical Officer	Clinical Officer and Medical Assistant	Clinical Officer and Medical Assistant and nurse
Dispensing ART/drugs	Medical Assistant/Nurse	Nurse/Pharmacy Technician/Dispenser	Dispenser
Ward rounds	Medical Doctor	Clinical Officer	Clinical Officer and Medical Assistant
Complicated cases and treatment failure, 2nd line	Medical Doctor	Medical Doctor	Medical Doctor and Clinical Officer
Health centre			
HTC	Nurse	HSA/Lay Counsellor	HSA/PLWHA
ART initiation	Medical Doctor	Clinical Officer, Medical Assistant and nurse	Medical Assistant and nurse
Follow-up, OI management and referral	Medical Assistant	Nurse and Medical Assistance	Nurse/Medical Assistants/Trained HSA
ART dispensing	Medical Assistant and Nurse	Nurse and HSA	HSA
Improved health post			
HTC	Nurse	Lay Counsellor and HSA	PLWHA
WHO clinical staging	Clinical Officer	Nurse	Nurse
Group counselling	Nurse	Nurse and HSA	PLWHA
Screening and OI management	MA	Nurse	Nurse
Defaulter tracing	Nurse	Nurse and PLWHA	HSA and PLWHA
Support group activities	Nurse	Nurse and PLWHA	PLWHA

ART, antiretroviral therapy; HTC, HIV testing and counseling.

of 2008, over 9000 patients – 67% of the total ART cohort – were registered within the community support network.

In 2009, community support was further expanded through the establishment of improved health posts (IHPs) serving a catchment population between 5000 and 15 000 and staffed by a community nurse visiting once or twice per month, two or three HSAs and three 'patient support attendants' (adherence supporters/peer counsellors). These health posts provide a minimum package of HIV services, including HTC. People testing HIV positive undergo systematic screening for opportunistic infections and are staged by the community nurse according to WHO clinical criteria. Among those in WHO Stage I and II, blood samples are taken for CD4 counts to determine ART eligibility. According the national guidelines, patients in WHO Stage III and IV and those with a CD4 count below 250 cells/mm³ are referred to the nearest suitable site for ART initiation, after having attended individual and group counselling sessions at the IHP. After an initial follow-up period at a health centre or district hospital, patients without complications may receive refills of ART at the IHP. By providing pre-ART and ART care close to patients' homes, IHPs aim to enhance retention in care and decongest the health centres. More recently, a range of

essential non-HIV services has been made available at the post, including family planning and care for chronic diseases (epilepsy, diabetes and hypertension). Malaria diagnosis and treatment will be provided in the near future.

Between 1400 and 2000 consultations take place on a monthly basis in IHPs and in 20 mobile community outreach sites, offloading 48% of the patient burden on health centres. On average, 145 patients per month are prepared before referral to the initiation site, accounting for an 80% reduction of pre-ART group counselling care in health centres (Bemelmans *et al.* 2009).

Decentralization of care

As of end of December 2009, in addition to the two hospitals, ART initiation had been decentralized to seven peripheral health centres up to 60 km away from the district hospital. A total of 21 sites (two hospitals, 14 Health Centres, five IHPs) provided follow-up ART care after the initiation period. As a result, the proportion of the ART cohort followed up at hospital level has steadily fallen over the past years.

Operational research performed in 2006 and 2007 compared patient outcomes between those who started

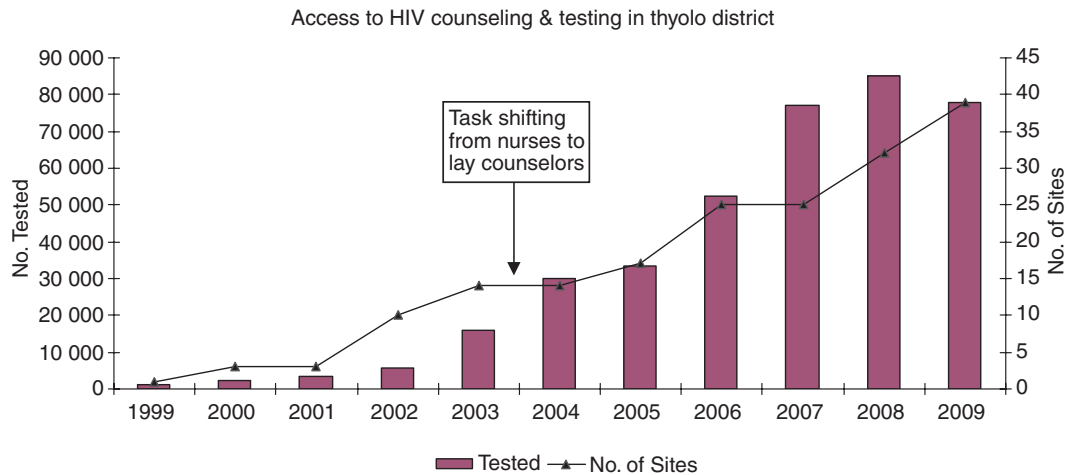


Figure 1 Access to HIV testing and counseling.

ART in the hospital and those who started in a health centre. Retention rates after 1 year on ART were acceptable: 85% for both hospital and health centres. Losses to follow-up were lower in health centres (1.5%) compared to hospital (7.8%), but mortality was higher (12.8% *vs.* 7.0%). (Massaquoi *et al.* 2009).

Programme outcomes

Access to HIV/AIDS services

The shifting of HTC from nurses to trained HSA counselors supported an increase in testing capacity from 14 sites at the end of 2003 (with an average of 93 tests per month performed at each site) to 39 sites at the end of 2009 (with 167 tests per site per month) (Figure 1). The proportion of patients testing positive decreased from 36% in 2003 (5612/15 618) to 16% in 2009 (12 364/77 736), likely as a result of the wider coverage.

The delegation of ART initiation and follow-up from doctors to clinical officers and medical assistants more than tripled the number of new inclusions from 103 per month in 2004 (when ART initiation was available only at the district hospital) to 408 per month in 2009 per month in the district (with ART initiation offered in nine facilities) (Figure 2). In addition, 2636 patients who previously received ART at the district hospital were transferred to health centres for follow-up treatment.

Antiretroviral therapy

Between 2003 and 2009, a total of 23 261 patients started ART. As of end 2009, 14 680 (63%) were reported alive and in care, 3271 (14%) had been transferred out to other

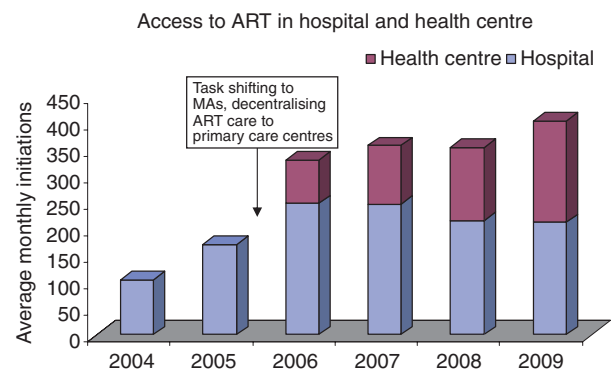


Figure 2 Access to antiretroviral therapy in Thyolo district; MA, medical assistant.

facilities, 2749 (11.8%) had defaulted, 2519 (10.8%) died and 42 (0.2%) stopped treatment. This compares favourably with other ART programmes in the region (Braitstein *et al.* 2006). Death rates were similar between primary and secondary level, but defaulters were higher in hospital (15%) compared with health centres (8%) (Table 3). Across the health service, improved coverage has allowed patients to start treatment earlier at a higher CD4 count from 147 cells/mm³ in 2003 to 204 cells/mm³ in 2009. Time to initiation decreased from nearly 100 days in 2003 to less than three weeks in 2009. This will have an important impact on survival (Battegay *et al.* 2006, Miller *et al.* 2009).

Targets for district-wide universal access in Thyolo were calculated on the basis of available information and assumptions. ART need was estimated at 11 500 patients in 2007 and 17 250 in 2009. Over 9000 patients were

Table 3 ART outcomes at the hospital and health centres 2003–2009

	Hospital (<i>n</i> = 12 219)	Health Centres (<i>n</i> = 11 042)
Alive	6442 (52.7%)	8238 (74.6%)
Transfer	2601 (21.3%)*	670 (6.1%)
Died	1290 (10.6%)	1229 (11.1%)
Lost to follow-up	1872 (15.3%)	877 (7.9%)
Stopped	14 (0.1%)	28 (0.3%)

ART, antiretroviral therapy.

*Note that some of these transfers will have been down-referred to health centres.

receiving ART in 2007 and over 14 000 in 2009. Using the definition of universal access as covering 80% of the need, this means that universal access was achieved in 2007 (Massaquoi *et al.* 2008) and has so far been sustained. (Note that these estimates were derived from models used by the Ministry of Health at the time; more complex models have since been developed to estimate the number of people in need of treatment, taking into account dynamics such as accumulation of people on treatment and population dynamics.)

Human resource efficiency gains

By task shifting and streamlining the organization of care, an increasing number of patients were able to access HTC, ART and other services with only a relatively small increase in the total number of health staff. Based on an average HTC time of 25 min, task shifting of the 6500 tests performed every month in the district from nurses to HSA-counsellors resulted in saving 2708 nursing hours per month [equal to 17 FTE nurses]. Task shifting of ART refills and adherence counselling (estimated task time 15 min) to HSAs in Health Centres meant a 463 h/month save of medical assistant/nurse time (equal to three FTE). Figure 3 illustrates the increased effectiveness of staff utilization over time.

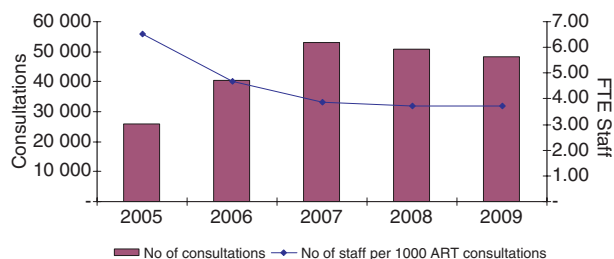


Figure 3 Increased staff-efficiency with increasing number of consultations in Thyolo District Hospital.

These gains have contributed to the cost-effectiveness of the ART programme: a recent analysis found that the average annual cost for achieving universal access amounted to an additional €2.6 per inhabitant/year, which is well within the minimal basic health package costs estimated by WHO, though not yet within the national health expenditure per capita (Jouquet *et al.* 2009).

Discussion and Conclusion

Achieving and maintaining large-scale access to ART in Thyolo district was enabled by a public health approach that allowed task shifting, decentralization and simplified care, and engaged multiple levels of health care as well as the community. ART initiations have more than tripled and the time to initiation has decreased fivefold.

Over the past years, support offered at community level evolved from palliative care to a focus on treatment literacy and adherence. Task shifting to different cadres of health staff, community workers (HSAs) and 'peer counsellors' decreased workload of overburdened clinical staff while contributing to a more equitable delivery of services.

Despite these achievements, the human resource crisis remains critical in Thyolo district, and it is clear that further task shifting options will need to be explored as the current model will be unable to sustain ART coverage in the light of the ever increasing case load. Future innovations include the full engagement of nurses in ART initiation (currently limited by the number of nurses and workload), and the delegation of more tasks to HSAs, peer counsellors/expert patients and community support groups.

Malawi faces the double challenge of needing to continue the expansion of access to improved first-line ART while having to ensure quality follow-up and care for those already on treatment, including those requiring second-line regimens. Recent WHO recommendations promote earlier initiation of ART (WHO 2009), and this is estimated to increase the number of people eligible for treatment by 20–30% (Ministry of Health 2010a,b). Further innovations on task shifting and simplified models of ART delivery while retaining patients in care must continue to be explored in Thyolo and in Malawi as a whole. The proposed policy is to initiate all pregnant HIV-infected women on life-long ART regardless of clinical or immunological status. These changes together with a steady accumulation of people alive on ART – approximately 3% of the adult population is currently on ART and this is expected to triple in the coming 10 years – are estimated to require significant

additional staff for the country as a whole (Ministry of Health 2010a,b,c).

Task shifting will thus remain a necessity in Malawi, to satisfy the increasing demand on HIV services. However, task shifting must be seen as a part of an overall strategy which has to additionally include tangible measures to increase and retain existing and new cadres of staff (Philips *et al.* 2008). Issues requiring attention in Thyolo District include appropriate remuneration and support packages for HSAs, as well as appropriate supervision structures.

The provision of support for people on ART will need to evolve over time as patients face new challenges related to long-term adherence and retention in care. Models of support will need to be elaborated at the community level to ensure as much as possible that ART care is made to fit into people's lives, rather than requiring people to fit their lives around ART. Clinical challenges can also be expected to change over time (e.g. development of non-AIDS defining illnesses, long-term toxicities, drug resistance) that will require strong supervision of health care provision at the peripheral level. Ensuring long-term support means ensuring sustainable financing for treatment. Currently, all funding for first- and second-line drugs for adults is provided by the Global Fund, while all paediatric drugs are provided by UNITAID. Such external support will need to be sustained for the foreseeable future, particularly in light of the fact that Malawi has planned to revise its national guidelines in line with the latest WHO Guidelines to include tenofovir in the first-line regimen and initiate treatment earlier.

Key messages

- Experience from Thyolo district, Malawi, over the last 8 years shows that universal access to ART can be achieved and sustained in resource-limited rural settings
- Task shifting is a proven strategy to support increased access to ART care in settings where human resources for health care are scarce
- The decentralization of care from hospital to health centre level can be achieved in a manner that reinforces primary health care services
- Innovative programme adaptations must continue to support the further expansion of ART coverage while maximizing long-term benefit for those already receiving treatment
- Training and supervision of staff are performed, TS and decentralization of ART care can be applied with acceptable programme outcomes

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