

# ADVANCED HIV DISEASE: EVERY LINK IN HEALTH CARE MATTERS!

## Implementation of the 'circle of care' in rural Nsanje district, Malawi

Nsanje HIV/TB project, December 2020, MSF-Operational Center Brussels



**MEDECINS SANS FRONTIERES**  
**DOCTORS WITHOUT BORDERS**

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# ACRONYMS

ART	Antiretroviral treatment	IQR	Interquartile range
AHD	Advanced HIV Disease	LTFU	Lost to follow-up
CAG	Community ART group	M&E	Monitoring and Evaluation
CBO	Community-Based Organisation	MoH	Ministry of Health
CCU	Critical Care Unit	MSF	Médecins Sans Frontières
CMV:	Cytomegalovirus	NDH	Nsanje District Hospital
CrAg	Cryptococcal Antigen	OI	Opportunistic infection
DHO	District Health officer	OPD	Outpatient Department
DILI:	Drug-induced liver inflammation	PHC	Primary Health Care
DTG	Dolutegravir	PJP	Pneumocystis Jirovecii Pneumonia
HIV	Human immunodeficiency virus	PLHIV	People living with HIV
HCMC	Health Center Management Committee	PoC	Point-of-Care
HDA	Health Diagnostic Assistant	RAU	Rapid Assessment Unit
HP	Health Promotion	TA	Traditional Authority
HSA	Health Surveillance Assistants	TB-LAM	Tuberculosis-Lipoarabinam test
HR	Human resources	TPT	Tuberculosis prevention treatment
IPD	Inpatient Department	VL	Viral load

# ACKNOWLEDGMENTS

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# FACT SHEET NSANJE

Malawi is a high HIV prevalence country. In 2019, 8.9% adults 15-49 years were living with HIV.<sup>1</sup> Huge progress has been made in the fight against HIV over the past 10 years and has brought the country closer to the 90-90-90 goals.<sup>2</sup>

Nsanje is one of the most affected districts, with an HIV prevalence of 12.1%.<sup>3</sup> The district hosts approximately 22,660 (Q3 2020) people living with HIV (PLHIV) and on ART, and it also has a high mortality related to Advanced HIV Disease (AHD). High rates of TB/HIV co-infection (52% of people with TB are also living with HIV) set TB as a main cause of mortality for those patients.

PLHIV in Nsanje still face many challenges in accessing treatment, both at the level of health structures and in the community. Traveling to a health center can be expensive, time

consuming and difficult to access in rainy season. Also, there are shortages of health workers with crowded waiting areas.

From May to December 2016, a prospective analysis of admissions and deaths in Nsanje District Hospital (NDH)<sup>4</sup> revealed that a quarter of all admissions in NDH were related to HIV (26%, 303/1,183); 60% of PLHIV arrived with severe immune-suppression; 91% of PLHIV knew their status, and 77% of them were ART-experienced. A third (29%, 89/303) of patients admitted with HIV died.

The high inpatient mortality amongst PLHIV in NDH was the main driver to shift the project activities towards implementing and enhancing the full "circle of care" for patients with AHD. This was supported by the just released 2017 WHO recommendations on management for AHD.<sup>5</sup>



Nsanje is a remote, sparsely populated and largely rural district in southernmost Malawi in the valley of the Shire River, engulfed by Mozambique. The area of 1,942 km<sup>2</sup> has around 299,168 inhabitants.

Nsanje is the second poorest district in Malawi, with 74.3% living in poverty and 37% in ultra-poverty.

Given the climate and isolated location, it is difficult to acquire and retain healthcare workers of all cadres. Only 32% and 20% of Medical and Nursing/Midwifery cadres are filled respectively.

Figure 1: Basic information on AHD from a leaflet for PLHIV and community

## WHAT IS ADVANCED HIV DISEASE?

WE TALK ABOUT ADVANCED HIV DISEASE (AHD) WHEN:



A patient's CD4 drops below 200 copies.



Patient has a severe illness such as TB, a severe infection of brain, lung etc.



All HIV infected children below 5 years are considered AHD patients.

### AHD DEVELOPS WHEN:

- **People living with HIV are not diagnosed early** and/or do not start ART before their immune system becomes weak.
- **ART is stopped or fails**, has been interrupted or not taken regularly, or a specific regimen is no longer effective for a patient

### PATIENTS WITH AHD REQUIRE DEDICATED CARE:

- Some patients with AHD need to be hospitalised immediately.
- Others can get the care they need at PHC level.
- Some patients with AHD may still feel well but need close follow-up.

A patient with advanced HIV disease is at high risk of death, even after initiation of ART. This risk increases with decreasing CD4 cell count. The leading causes of death amongst this population are tuberculosis (TB), severe bacterial infections, and cryptococcal meningitis.

1 UNAIDS <https://www.unaids.org/en/regionscountries/countries/malawi>

2 UNAIDS <https://www.unaids.org/en/resources/909090> and Malawi 2018 HIV clinical guidelines.

3 Malawian population survey, 2017.

4 Médecins Sans Frontières (MSF), non-published data.

5 WHO Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy. Policy brief, July 2017.



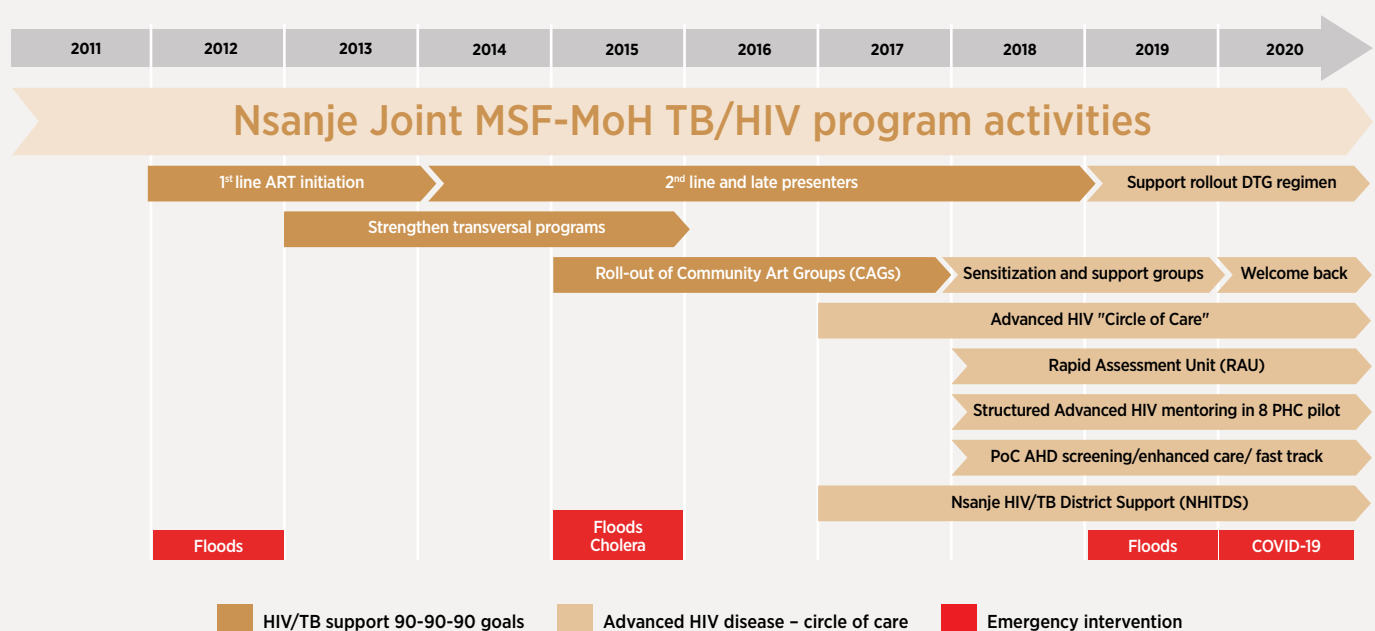
# "A JOURNEY WORTH WALKING": MSF IN NSANJE – 2011-2020

MSF has been present in Malawi since 1986, following the influx of refugees from Mozambique. In 1996 MSF-OCB (MSF-Operational Center Brussels today, MSF-Luxembourg at the time) opened a project in Thyolo district to support the provision of HIV care for the following 20 years. From 2011 till 2020, MSF worked in Nsanje District in collaboration with the District Health officer (DHO) to improve access to quality HIV care, primarily through mentorship and targeted health system strengthening activities (Nsanje HIV/TB district support report<sup>6</sup>). The goal was to develop a lighter system of support, with fewer resources required but more focus on staff learning and capacity building than the Thyolo project (which was closed in 2016). Nsanje was identified as the most remote and least resourced district of Malawi. During this time MSF piloted and launched a dashboard to monitor in a collaborative manner with the DHO the progress of the programmatic implementation of all elements of the HIV cascade of care in the district. It was considered a major success.



**In summary, the main drivers of the evolution of Nsanje MSF project were:**

- The finding of a high inpatient mortality rate in Nsanje district hospital.
- Evidence of poor general quality of care delivered at PHC.
- Geographically expanded district with broad distribution of PHC centers and difficult communication and access between the healthcare structures.
- Aim to impact and reduce mortality of patients at immediate risk of death (4<sup>th</sup> 90).



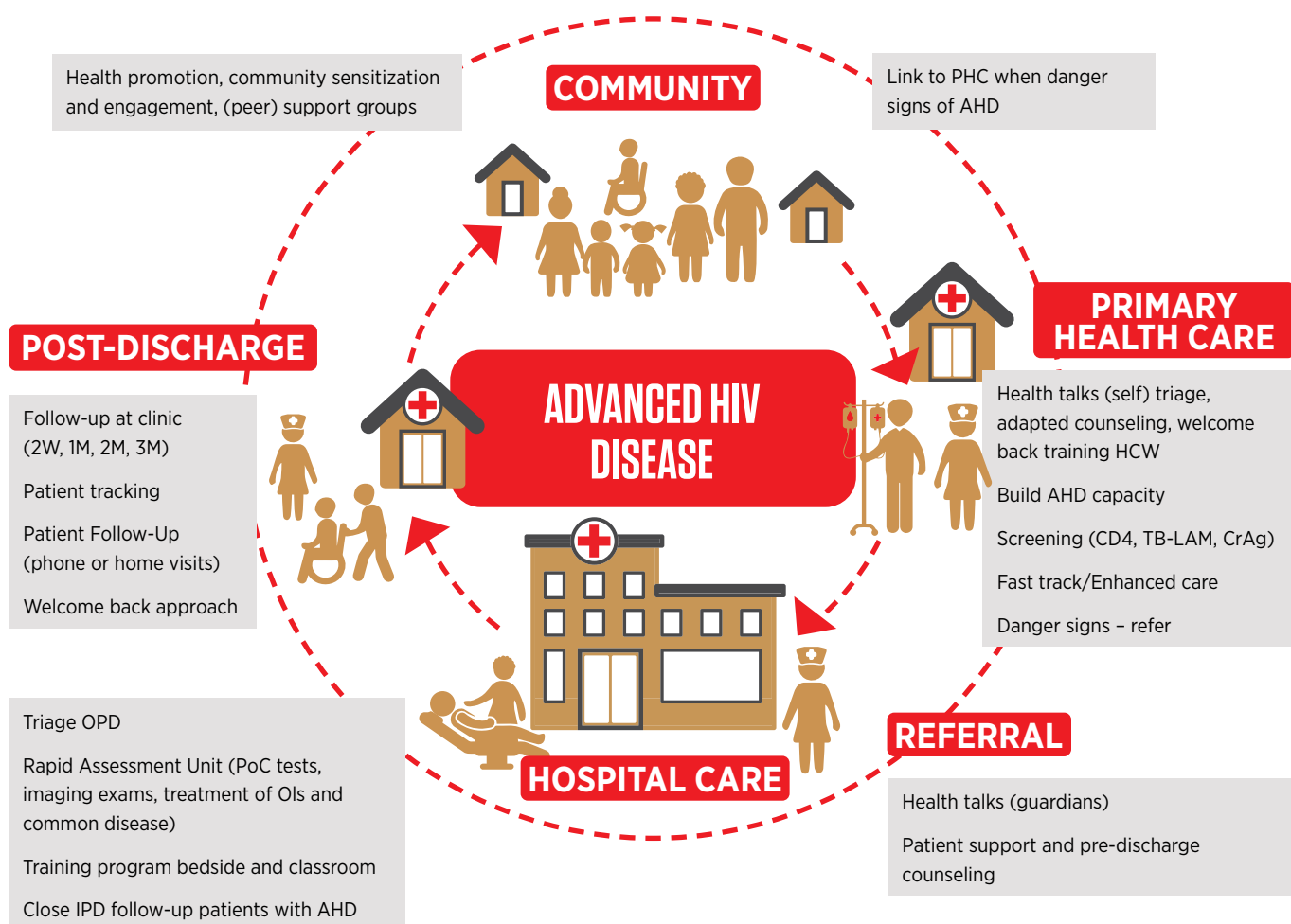


# THE “CIRCLE OF CARE” FOR ADVANCED HIV DISEASE

Starting in 2017, the MSF Nsanje intervention evolved from a general linear HIV/TB support model aimed at achieving the 90-90-90 goals towards a focus on enhancing AHD care, a model that we call “the circle of care”. When PLHIV start ART, it is for the long-term, but along that journey patients

might disengage from and re-engage into care. Maintaining perfect adherence depends on the treatment itself (being accessible, efficient and well tolerated), the degree to which the environment is welcoming, as well as the capacity to overcome several barriers in life.

The model includes interventions and packages of care to ensure continuum of care, communication, alignment, collaboration and coherence between the community, PHC and hospital. The patient with AHD remains central to this circular process.



In this briefier, MSF shares the process of implementing this model in remote Nsanje: the experiences, package of activities offered at every level with results, challenges and recommendations, including testimonies of patients.

We invite readers to watch a short movie giving visual insight into our Nsanje project concerning the circle of care (<https://youtu.be/ciWRzPRVsNs>)

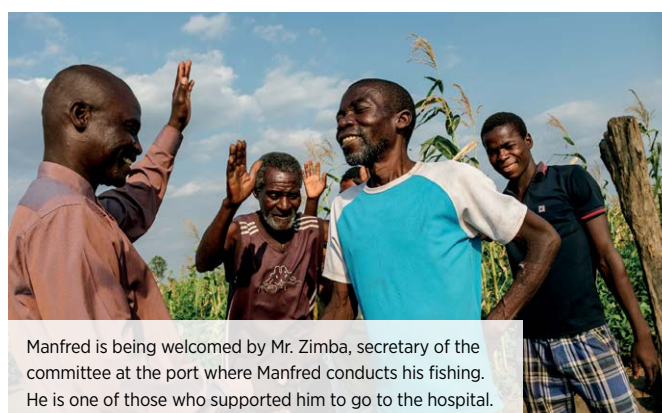


# COMMUNITY INTERVENTIONS TO IMPROVE AHD AWARENESS AND PATIENT'S LINKAGE TO CARE

With the aim to reach patients in remote areas as well as those close to health structures, the community intervention was focused on the following:

- Increasing awareness of AHD and danger signs, and influencing health-seeking behavior using existing community structures and other far-reaching channels.
- Reinforcing community networks for patient/peer support.
- Creating linkages between community structures and healthcare structures.

Table 1 below presents the mapping of the structures in Nsanje community.



**Table 1: District structures and services to support community awareness, empowerment, and linkage to care of patients with AHD**

EXISTING DISTRICT STRUCTURES			
Level	Healthcare delivery system	Service offered	Actions
<b>District</b> 1 District Commissioner	1 NDH (1 DHO)		Joint committees District Health Management Committee
<b>Community</b> Division Westbank-Eastbank: 9 catchment areas, each with 1 Traditional Authority (TA)  Community-based organization (CBO)  Youth groups, women's groups, PLHIV support groups, etc.	2 Rural Hospitals: CHAM Trinity/Kalemba*		Health Promotion (HP) activities in facility waiting areas Welcome back initiative Post-discharge support
	14 Health centers (1 in charge/HC)	Secondary care Primary care Referral to tertiary care	Health Centre Management Committee (HCMC) Referral support HP activities in waiting areas
	Outreach clinics (especially during floods) Health Surveillance Assistants (HSAs)	Primary Care Referral to secondary care	ARV-distribution Peer education and support Support groups for PLHIV Search for lost to follow-up (LTFU), missed appointments Link community with Health Centers
	Expert clients		Introduce HSAs in community groups
	Nyanthepa community radio	Broadcast messages for AHD through jingles and panel discussions	
<b>Local radio</b>		Influence believers on health-seeking behavior	
<b>Religious leaders</b>	Pastors Fraternal	Messages in sermons	

\* Facilities identified in map page 4

## Collaboration with and engagement of existing community structures



### Traditional leaders/authorities (TAs)

#### WHERE? WHO?

TAs gather representatives of all villages in their catchment area.

#### WHAT?

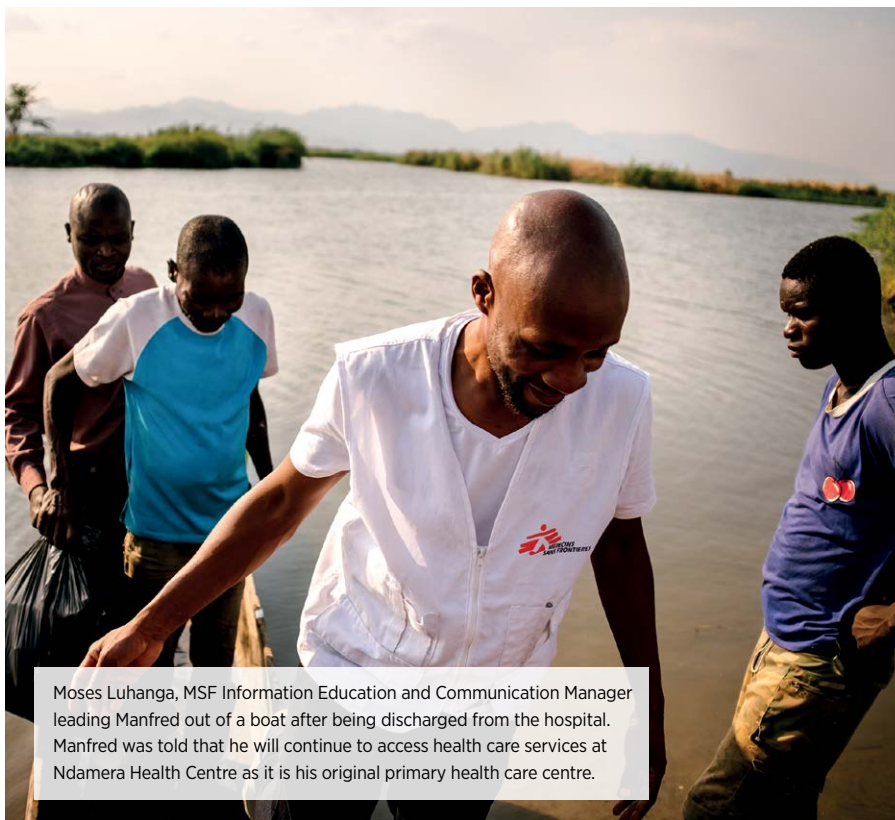
MSF joins quarterly meetings with TAs to discuss the barriers that communities face when trying to access health services and promote local accountability to address gaps in care.

#### WHY?

TAs are respected local leaders, the ears and eyes of the community. Involving them in the challenges MSF faces to reach and care for people in their community has been shown to have a powerful impact on leveraging action and creating bridges between MSF and the community, thereby enabling better tracing of LTFU, information sharing for AHD awareness, and facilitating health assessments, etc.

***“MSF has reached us on our doorstep with health messages and services like smooth ARV distribution (e.g. 6-month refill). Let’s respond positively to what they advise us, let’s share these messages to all our communities.”***

*Ndamera, Traditional Authority*



Moses Luhanga, MSF Information Education and Communication Manager leading Manfred out of a boat after being discharged from the hospital. Manfred was told that he will continue to access health care services at Ndamera Health Centre as it is his original primary health care centre.

### Support Groups (Collaboration 2015–2020) and Community ART groups (CAGs)

#### WHERE? WHO?

Support group members are PLHIV residing in the same catchment area. MSF revamped 38 support groups from 2018 onwards, reaching around 1,200 active members.

#### WHAT?

PLHIV form a group on a voluntary basis and meet regularly to benefit from peer support. Groups provide an opportunity to share and discuss experiences, stigma-related issues and updates on HIV activities.

#### WHY?

MSF wanted to engage HIV-positive peers and communities to influence health-seeking behavior, to speak out and help group members. For AHD, sick patients were linked in a timely manner back to care, and PLHIV understood the importance of treatment adherence in preventing AHD.





A member of a support group reading an advanced HIV brochure focusing on the danger signs at Ndamera Health Centre in Nsanje district.

## Health Surveillance Assistants (HSAs) and expert clients

### WHERE? WHO?

HSAs are trained community members linked to a primary-level health facility who deliver a range of services in communities. One HSA can support around 1,000 households after a 12-week training program. They are a recognized cadre and paid by government. Expert clients are literate PLHIV supported by Partners in Hope (an International NGO implementing in Malawi) or just volunteering. They are trained in LTFU tracing, adherence support and counseling.

### WHAT?

HSAs are key in expanding health service coverage, responding to emergencies, and reaching hard-to-access populations. These services include information and health promotion on hygiene and sanitation, immunizations, pediatric growth monitoring, antenatal and postnatal care education, nutrition counseling, family planning, disease surveillance, HIV testing and counseling, ART distribution and other basic health services. Expert clients are responsible for LTFU tracing and peer support. They can also act as lay counselors and give health talks in their respective health centers.

### WHY?

Additional resources are needed to support PLHIV. The presence of HSAs and expert clients in the community and in health centers helps create a link between those two levels, and they assist with tracing and guiding PLHIV.

## Health Center Management Committee (HCMC)

### WHERE? WHO?

Each one of the 14 health facilities has a committee with 15 members: 3 health facility managers and 12 community members representing several villages and layers of the community (youth, women, elderly, disabled, PLHIV) in their respective health structure.

### WHAT?

HCMCs meet on a quarterly basis to discuss issues on access to health facilities. Initially, HCMCs had an only an advisory role, but their role expanded in a positive manner with closer involvement in the health care activities, i.e. being present and signing when receiving donations, opening new services or medical activities, contributing to inventory of pharmacy, etc. This closer involvement also strengthened the accountability of the health facilities for health care delivery to PLHIV and the general population. New services and difficulties in patients' follow-up are discussed including welcome back attitude and patient discharged from hospital.

### WHY?

There is a need to address the health information gaps like immunization, drug ruptures, and cholera sensitizations. HCMCs have a role in this. Health promoters entrusted them with AHD awareness and the challenges around follow-up of patients and their re-engagement in care.

## Joint committee

### WHERE? WHO?

Joint committees are an MSF initiative that started as part of the Nsanje HIV/TB health district support. Quarterly joint meetings were organized with national, regional and district council representation invited and was managed by the District health management team with the support of MSF.

### WHAT?

A quarterly meeting aimed to present and review implementation progress. Community members presented shortcomings and/or successes, and they took back the updates on activities to their respective communities.

### WHY?

These joint committees help strengthen the accountability of the District towards beneficiaries, PLHIV and patients with AHD.

***“Previously, most HIV/TB health promotion activities were only done at a health facility level by health surveillance assistants (HSAs) or nurses. The awareness didn’t reach remote communities. Bringing HSAs to the support groups and having interactive discussions regarding their struggles created ownership amongst members to help each other and the surrounding community.”***

Moses Luhanga, Information and Education Manager



## Other channels of community sensitization on AHD and health seeking behavior

### Community radio programs

#### WHERE? WHO?

Nyanthepa community radio station in Nsanje reaches remote rural areas in the district. MSF has collaborated with them from 2018.

#### WHAT?

Main messages are broadcasted in repeated jingles in local language and adjusted on a quarterly basis by the HP team to include: what is AHD, what are the danger signs, the importance of adherence and how to know when to come to the health facility. Live programs and panel discussions with experts in specific field are also part of this effort.

#### WHY?

This local radio is popular and reaches into the community, particularly in difficult times like emergencies. For some remote communities this is the only connection they have with the rest of the district, country and world. Amongst the audience are PLHIV and their caretakers, of which many are illiterate. Using this channel helps to give real time information and clarify misconceptions.

### Collaboration with local religious leaders (Pastors Fraternal)

#### WHERE? WHO?

Religious leaders have one umbrella body – Pastors Fraternal – overseeing all pastor activities in the different churches across the entire district. Pastors Fraternal is led by an executive committee, which was identified as the starting point for MSF to interact with churches.

#### WHAT?

Every Sunday, special announcements are scheduled to cover topics like health, governance, religious and other. Congregants take the messages home to share with community members. HPs used this opportunity to share AHD basics and to distribute leaflets to pastors.

#### WHY?

Pastors are an integral part of the community and are known to have a strong influence on the health behavior of their followers.

### Community interventions: Lessons learned

- Plan community engagement from the start: map and build upon existing community structures and scale up interventions for mutual understanding to expand AHD awareness and activities in large rural communities.
- Involve community in assessments, planning of interventions and decision making.
- Consider visual tools and give opportunities for oral feedback forums to reach populations with high degrees of illiteracy.
- Anticipate the need for motivational support to achieve success, to promote active involvement, and to have functional committees or community groups (e.g. allowances, trainings, capacity building).

***During COVID time, social media led to misconceptions, fear and stigma towards PLHIV. Live discussion on radio, amidst restrictions on social gatherings, allowed continued interaction and sharing updated information.***



Home sweet home. Having stayed in the hospital for some time, Austin is released from the hospital. In the picture Austin and his wife Patuma are arriving home after being discharged from Nsanje District Hospital. In the hospital, he was diagnosed with advanced HIV.

# PRIMARY HEALTH CARE INTERVENTION: SCREENING, DIAGNOSIS AND MANAGEMENT OF AHD

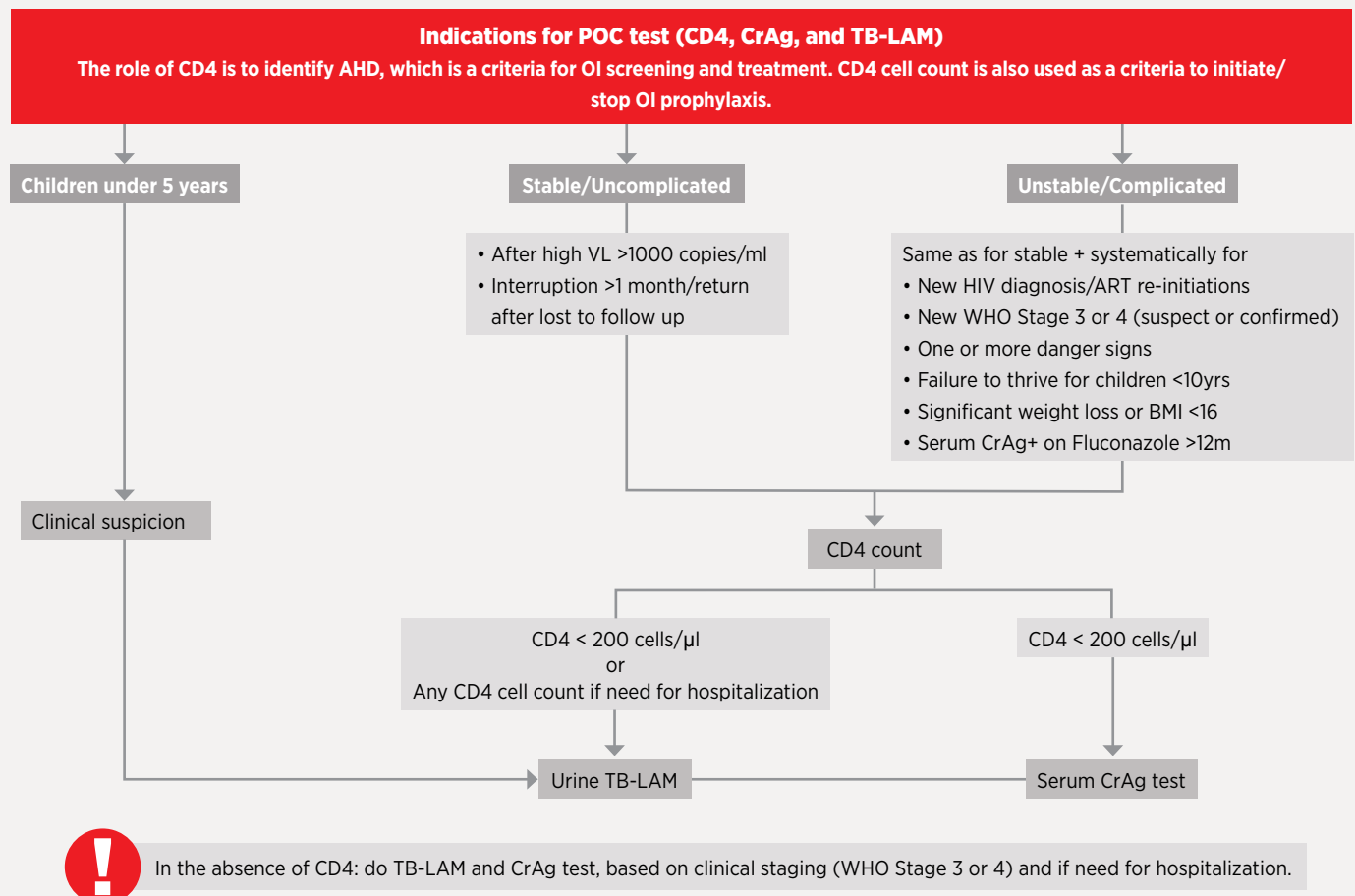
## Organization of PHC structure and package of care

PHC facilities are the first points of contact for PLHIV seeking health care. MSF supported the implementation and decentralization of the AHD package recommended by WHO (WHO, 2017) in eight PHC pilot sites in the district aiming to identify AHD-related conditions early and to support patients with either referral to hospital or treatment at PHC level.

The flow of patients is illustrated in Figure 1 below. The package implemented at PHC included the following components:

- ◆ Baseline CD4 cell count for:
  - Newly diagnosed patients with HIV
  - PLHIV re-initiated on ART
  - Patients with Stage 3 and 4 WHO clinical staging
  - Patients with high viral load
- ◆ Screening of danger signs and introduction of clinical management algorithms
- ◆ Screening and diagnosis with PoC tests for TB and Cryptococcal infection, which are opportunistic infections (OIs) that are among the leading causes of mortality
- ◆ Early ART initiation and management of possible ART failure
- ◆ Prevention strategies (included in national clinical management guidelines since 2018):
  - Preemptive fluconazole treatment for patients with a serum Cryptococcal Antigen (CrAg) positive result
- Patients presenting with danger signs, failure to thrive
- Treatment interruptions, etc.
- Cotrimoxazole for all PLHIV
- Tuberculosis preventive therapy (TPT) with Isoniazid for a 6-month duration
- ◆ Referral to hospital care for patients with criteria for hospitalization
- ◆ Initiation of anti-TB treatment
- ◆ A health promotion and adjusted counseling package on AHD to explain flow of patients in the facilities and offer referral and post-discharge follow-up system
- ◆ Post-discharge follow-up for patients who have been in hospital care

Figure 1: Flow of Patients in PHC setting



The flow of patients in the facilities was re-defined to accommodate and facilitate early identification and management of patients at risk of severe illness. Table 2 summarizes the steps of the pathway for patients with AHD at PHC. One of the implementation challenges at PHC remains how to identify the best model to

decentralize the AHD package. The discussion remains between two major approaches: hub & spoke vs. decentralization of services at all PHC facilities. A summary of main risks/benefits of each model in our experience is presented in Table 3. We believe that the diagnostics package can be disaggregated

from the clinical management package and one component can be decentralized whereas another one not. Also, there is no one fixed model that can answer the needs of all contexts, so an assessment context will help define how the model can be tailored.

**Table 2: Pathway steps of patients presenting with AHD at PHC**

Package	Description	Where?	Who?
<b>Health talks</b>	Health talks and education on danger signs, drug compliance and adherence, self-triaging.	Waiting area	HPs
<b>Triaging</b>	Orientation of patients based on state of stability at client reception.	ART clinic	Nurse
<b>Fast-track</b>	Stable clients go to ART nurse for refills (6-month refill), yearly checks, viral load (VL) performance.	Nurse room	Nurse
<b>Enhanced care clinic</b>	Suspicion of AHD clinical consultation and patient management of unstable clients, referral if needed (see Annex algorithm).	Clinician room	Medical assistant or Clinical officer
<b>Counseling/welcome back to care</b>	Patient centered counseling and education for newly diagnosed clients and clients with adherence challenges.	Counseling room	Patient supporter/ Lay counselor
<b>HIV/TB integration</b>	Provision of services under one roof for HIV/TB co-infected clients.	TB office	TB officer
<b>Point-of-Care tests</b>	Eligible clients tested for CD4, TB-LAM and serum CrAg (see algorithm in Annex 2).	PoC room	HDA

**Table 3: Summary risk/benefits hub & spoke vs. decentralization model**

	Decentralized services	Hub & spoke
<b>Benefits/opportunities</b>	<ul style="list-style-type: none"> <li>• Increase access to AHD services</li> <li>• Direct referral to hospital if needed</li> </ul>	<ul style="list-style-type: none"> <li>• Might lead to more efficient use of resources as they can be concentrated in one point</li> <li>• AHD expert clinical support</li> </ul>
<b>Risks/threats</b>	<ul style="list-style-type: none"> <li>• Lack of qualified staff to operate some PoC devices, like VL</li> <li>• Maintenance costs and network</li> <li>• Reduced package as a result</li> </ul>	<ul style="list-style-type: none"> <li>• 2-step referral means more time spent on procedures for patients</li> <li>• Mobile clinical team sustainability/cost</li> <li>• Restricted task-shifting</li> </ul>





## MSF mentoring approach

### WHAT?

The AHD mentoring package was designed to boost capacity and skills of healthcare workers to manage patients with AHD. It was implemented in a phased way at PHC level (Table 4).

### WHERE?

Eight pilot sites were identified (Table 5) – seven PHCs plus the ART clinic at the district hospital. The selection of facilities was based on the size of the HIV cohort, the link with the NDH health center, and the willingness of the facility to pilot the program.

### BY WHOM?

An MSF team composed of a nurse, clinician and a patient supporter did the mentoring. Each had specific technical duties and coached their respective mentees, who were MoH staff. Monitoring & Evaluation (M&E) services, a health diagnostic assistant (HDA), and laboratory and pharmacy support were given according to the meeting schedule of each clinic.

### WHY?

To capacitate healthcare workers in AHD management and scale up the implementation of the package of AHD care in PHC.

### HOW?

Alongside structured mentorship, the mentor and mentee consult patients together. They also conduct case discussion and file review together as part of the job training to obtain skills in identifying, diagnosing, and managing patients with AHD. Tools were designed as per Table 6.

Table 4. Implementation phases for structured mentorship

Phase	Activities	Technical working cadre
<b>Embedment/Preparatory phase (2 months)</b>	Development of teaching materials and curriculum. MSF Mentor/Ministry of Health (MoH) mentee selection and mutual written agreements. Implementation of infrastructure flow renovations.	1 CO 1 Nurse 1 Patient Support
<b>Intensive phase (4-5 months – weekly visit)</b>	Implementation of algorithms and pathways/Introduction to AHD, triage of the cohort stable (fast-track) and unstable clients (enhanced care), PoC screening for AHD and organization of teaching sessions.	2 COs 2 Nurses 1 Patient Support
<b>Monitoring &amp; Evaluation (M&amp;E) phase (2-3 months; frequency depending on needs)</b>	Follow-up of AHD care package and analysis results; identify gaps and reinforce where needed; monitoring tool and dashboard.	1 CO 1 Nurse 1 Patient Support

Table 5: Health facilities supported by MSF and their cohort sizes plus the timelines of support provision of the AHD package

Health facility name	Nsanje District hospital (NDH ART clinic)	Ndamera health center	Sorgin health center	Mbenje health center	Nyamithuthu health center	Tengani health center	Phokera health center	Kalemba health center
<b>Active ART cohort size 2020</b>	5,208	2,075	1,504	1,365	543	1,485	858	2,476
<b>Start of MSF support in PoC screening</b>	Q2 2018 (IPD and RAU) Q4 2019 (ART clinic)	Q3 2018	Q3 2018	Q3 2018	Q3 2018	Q4 2019	Q1 2020	Q1 2020

Table 6: Mentor/Mentee evaluation tools

Monitoring tool	Objective of the tool	Description of the tool
<b>Mentor/mentee handbook</b>	Progress of mentorship on knowledge and skills gained.	Hard copy with records of mentor/mentee agreement contract, summary of teaching sessions, scores and feedback evaluations.
<b>Mentee pre- and post-tests</b>	Comparisons of baseline knowledge and capacity invested.	Paper based tests taken from the beginning and at the end of teaching sessions.
<b>Mentee dashboard</b>	Showing trends of mentee performance throughout mentorship and state of certification.	Soft copy dashboard showing summary of mentee scores for each session and tests attempted (pre-test and post-test).

## Results achieved in the Nsanje mentoring program

The following tables show the main impact of the mentoring program on capacitation of the mentees, acquisition of certificates at the end of the program, and scoring test progress.

Table 7: Mentee enrollment and mentoring outcomes

Mentee cadre	Total enrolled	Total certified	Passing rate %
<b>Nurses</b>	24	24	100%
<b>Clinicians</b>	18	16	89%
<b>Patient supporters</b>	17	16	94%
<b>TB officers/HSAs</b>	8	7	88%



MSF Clinical mentor conducting side-by-side mentoring.

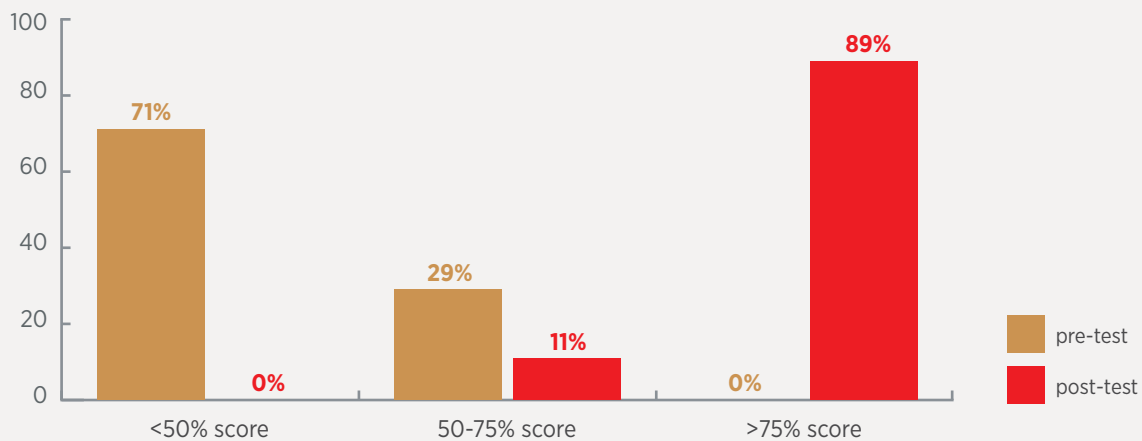
## Scale-up of Point-of-Care tests

Differentiated service delivery systems were introduced and patient flow adapted in close collaboration with MoH, to reach people at higher risk of AHD as early as possible. In order to give more time to clinicians to manage the patient presenting with AHD, to reduce the turn-around time of results, and to scale up access to testing in a rapid manner, task-shifting of PoC testing was done to lay cadres, known as HDAs. The PoC testing package included CD4, TB-LAM and CrAg. In the one NDH ART clinic and the seven PHC facilities, a

dedicated room for PoC was set up with material and supplied commodities. The PoC room became an essential part of the flow. Eligible patients were identified in the triage and oriented to the PoC room for same-day testing and results. From there, patients went to the consultation room for further clinical management. All individuals with positive TB-LAM and CrAg would be linked to a clinician for management. Patients in need of referral would also be supported at the PHC; unfortunately, however, referral of patients was not well documented.

Initially only MSF HDAs were performing the tests to reduce the burden on the paramedics in the busy ART clinics. HDA is a specific lay cadre responsible for the performance, quality assurance and stock management of the PoC tests. HDAs were also responsible for facilitating rapid access to quality results and prompt linkage to care. By mid-2020, in collaboration with the MoH, the MSF lab team mentored and trained HDAs from Partners in Hope, an NGO permanently present in the clinics, to enable continuation of services during all clinic opening hours.

Figure 2: Mentees score pre-test and post-test



Nurse giving 6-month refills in fast-track program.

Table 8: Characteristics of patients tested for AHD in the health facilities

	Total tested (%)
<b>Tested for CD4 cell count per facility</b>	
Ndamera	528 (22.8)
Mbenje	406 (17.6)
Phokera	165 (7.1)
Sorgin	604 (26.1)
Tengani	420 (18.2)
Kalemba	189 (8.2)
<b>Reason for CD4 testing <sup>♦</sup></b>	
ART commencement	1,069 (42.5)
Catch-up/baseline CD4 <sup>+</sup>	170 (6.8)
High HIV VL	181 (7.2)
Stage 3 or 4	135 (5.4)
Return after LTFU	19 (0.8)
Unknown	939 (37.4)
% CD4 <200 cells/μl	385/2,312 (16.7)
% CD4 <100 cells/μl	149/2,312 (6.4)
% Urine TB-LAM+ <sup>●</sup>	48/385 (12.5)
% serum CrAg+ <sup>■</sup>	18/385 (4.6)

**KEY:**

- ♦ Reason for CD4 testing are not mutually exclusive
- + Catch-up CD4 cell count test for all without any documented prior CD4 test
- Proportion of urine TB-LAM positive results regardless of CD4 cell count results
- Proportion of CrAg+ results regardless of CD4 cell count results



Lita is a lady that is HIV positive who has had adherence challenges. Lita was on ARV treatment before she disengaged for two months, before getting reengaged through Nsanje District Hospital's Rapid Assessment Unit (RAU).

## Scaling up screening for AHD in rural primary health facilities: A task-shifting experience from lay cadres in Malawi<sup>7</sup>

**METHODS**

In 2017, eight lay cadre HDAs were trained to conduct PoC AHD tests, including CD4 cell count (PIMA), urine TB-LAM, and CrAg lateral flow assay). They were deployed to 6 PHC facilities in Nsanje district. Patients eligible for a CD4 cell count test for any reason were tested, and those eligible for urine TB-LAM and CrAg were also tested. This routinely collected data was documented in AHD PoC registers and patient files. A retrospective analysis of this programmatic data, together with details on therapeutic interventions by clinicians, was conducted.

**RESULTS**

Between July 2018 and October 2020, HDAs conducted CD4 testing for a total of 2,312 patients, which represented an estimated 84.3% CD4 cell count testing coverage. A total of 385/2,312 (16.7%)

patients had CD4 <200 cells/ul. There were no significant differences in gender and age distribution among those with CD4 <200 cells/ul at the PHCs, with two-thirds being male and median age of 37 years [IQR: 29–44]. Median CD4 cell count among those with CD4 <200 cells/ul was 120 cells/ul [IQR: 78–166]. The total PIMA CD4 error rate in all eight health facilities was 8.3%.

There was a high uptake of urine TB-LAM (350 tests with 8.6% positive) and serum CrAg (345 tests with 4.3% positive) in all the health facilities. A total of 50% (15/30) patients testing positive in urine TB-LAM had a documented treatment initiation in their files by clinicians whilst 80% (12/15) of patients testing positive in serum CrAg had a documented treatment and or prophylaxis initiation for the cryptococemia. Documentation of

therapeutic interventions by clinicians in patient files was not sufficient. Developing efficiency in the AHD pathway together with clear patient clinic flows and successful implementation of differentiated ART models were important to minimizing excessive patient waiting times for AHD screening.

**CONCLUSION**

Our results highlight the feasibility of task-shifting for scaling up AHD testing in rural PHC facilities. National program managers should consider extending the range of PoC tests conducted by lay cadres and set up frameworks for supporting lay testers in AHD PoC testing in PHCs. However, task-shifting for AHD PoC screening is only beneficial if there are policies and plans for supporting the quality of testing together with availability of clinicians to rapidly act on the results.

<sup>7</sup> Zibusiso Ndlovu, et al. (in peer review process, not yet published).



## PHC intervention: Achievements and lessons learned

Through a growth in the competency of staff, healthcare facilities have been able to increase and improve screening, diagnosis and management of AHD at the PHC level.

### Some of the achievements are:

- Improved capacity to directly manage patients at the PHC level, which reduced unnecessary referral and allowed quicker treatment.
- Implemented task-shifting of activities to lower cadres. In one clinic, HSAs were not only responsible for PoC AHD testing but also for dispensing TB and ART treatments. In addition, patient supporters, as lay counselors of Partners in Hope, managed the provision of a counseling package with a focus on enhanced adherence.
- Decentralized TB diagnosis and treatment registration through the implementation of the TB-LAM platform in all pilot sites

and scale-up of the GenXpert testing with the support of NGO Riders for Health (who supported sample transport and results return).

- The AHD package roll-out at PHC was adopted at national level. The 2018 National Guidelines for HIV management included an addendum in 2019 dedicated to screening and management of AHD. After a visit from the MoH to the pilot sites that started in Nsanje, scale-up of more sites across the district and country was planned.
- During project closure, Partners in Hope worked with the MoH/MSF team and adopted the implementation of the package at PHC.

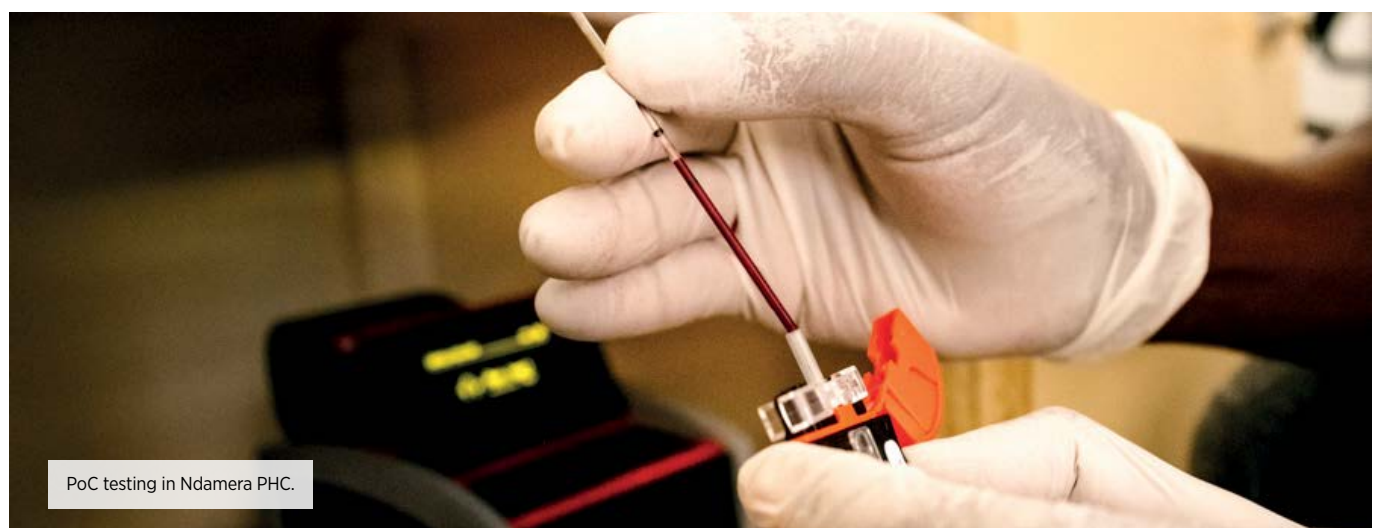
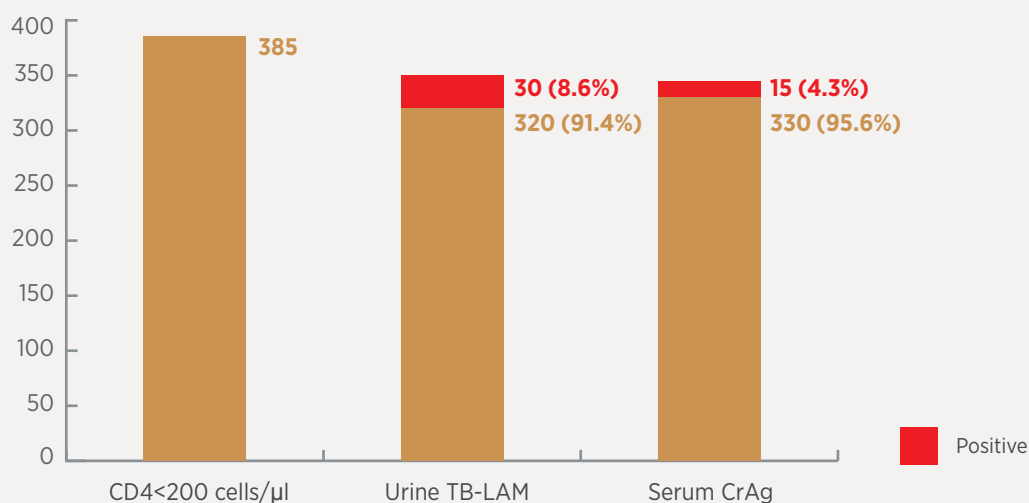
### Lessons learned:

- Motivational input to strengthen the successes of the program matters.

Ongoing supervision and training, along with mentoring and official certification is likely to reveal opportunities to bolster and sustain performance.

- Build upon existing infrastructure and make refinements to scale interventions and differentiated service delivery models: 6-month ART refill, one-stop clinic HIV/TB, enhanced care pathway.
- A clear patient flow in the health facility and staff orientation on the flow steps is essential.
- Maximize PoC coverage through adherence to the PoC algorithm and periodic review of patient triaging at all service delivery points.
- Strengthen two-way linkages between health facilities and HIV community structures through effective referral and post-discharge follow-up with standard procedures at different levels.

Figure 3: AHD testing cascade in PHCs



# RAPID SCREENING, DIAGNOSTIC AND MANAGEMENT OF PATIENTS WITH AHD IN NSANJE DISTRICT HOSPITAL

In 2017, following the baseline results of the 2016 hospital assessment that showed high inpatient mortality, MSF decided to support NDH to provide quality care for severely ill PLHIV.

## Introduction to the RAU package of care for AHD

To improve care for patients with AHD in the hospital, MSF designed a concept in the form of a Rapid Assessment Unit (RAU). The

RAU receives PLHIV in need of hospital care. There, patients get access to rapid diagnosis for main opportunistic infections, are clinically

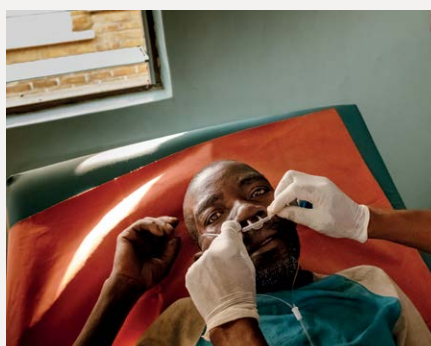
stabilized, and promptly receive the first dose of their life-saving treatment before being admitted in the inpatient wards (Figure 4).

Figure 4: The package of care provided by RAU



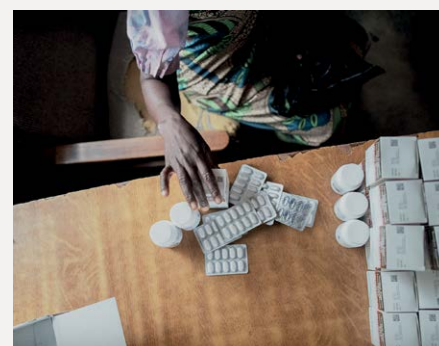
### Diagnose

- POC tests: CD4, TB-LAM, CrAg, hemoglobin, VDRL (Syphilis), Creatinine, urine dipstick, MRDT and glucose
- Other tests: VL and TB GeneXpert, CSF analysis, FBC, liver function test, renal function test
- Chest X-ray and ultrasound



### Stabilize

- Give O2 therapy and perform suctioning if needed
- Monitor vital signs
- Start fluid balance
- Tapping (Pleural effusion, ascites...)



### Treat

- Start first dose TT
- Make a clear medical plan and nursing care plan
- If needed: Admit in IPD
- Patient doesn't stay more than 12 hours in RAU
- Assure follow up in IPD

## Evolution of the RAU model in NDH: Implementation experience

The implementation of the RAU evolved progressively while responding to the different challenges encountered over time. As this was a new model, MSF displayed a flexible approach to adapt the care to the needs of patients and the hospital. Here, MSF shares the experience of this evolution and the lessons learned along the way.

RAU was initiated as a mobile unit – the Early Rapid Assessment Unit – in the inpatient wards. Later, patients were seen in an outpatient room used also for other emergencies. Finally, the RAU became a spacious and well-equipped unit with dedicated staff, next to a newly constructed critical care unit (CCU). Over time, and after realizing that some patients admitted to the

IPD did not access the RAU services, activities were put in place to ensure that the package would reach any PLHIV admitted in IPD. The program was jointly managed by MoH and MSF staff to ensure MoH ownership. Today, RAU activities continue in a dedicated space and as a component of the CCU organised by MoH staff.

Table 9: The RAU in NDH: Timeframes and highlights

	Early RAU	RAU – ER	RAU room + CCU + IPD follow-up	RAU + CCU + IPD detection and follow-up	Integrated CCU/ RAU + IPD
<b>Period</b>	Jan 2017 – Apr 2018	May 2018 – Apr 2019	May 2019 – Sept 2019	Oct 2019 – Jun 2020	Jul 2020 – Nov 2020
<b>Activities</b>	PoC tests for AHD done at bedside and early rapid management of diagnosed patients.	RAU as part of the general hospital emergency room became entry point for all PLHIV. Full package available.	Fully functional unit where rapid diagnoses, stabilization and first treatment are done in same room. Stricter and clear admission criteria.  Patients from RAU admitted in IPD are closely followed up, ward rounds and bedside training is done in TB, male and female ward.	RAU and IPD follow-up continue with enhanced identification of missed patients in IPD.  Opt-out HIV testing promoted in IPD.  Bedside testing restarted (samples analyzed in RAU).  Training of MoH staff started in RAU.	Hand-over period, practical workshops on management of patients with AHD in RAU and IPD, simplified triage.
<b>Place</b>	Mobile in hospital.	Small space embedded in Outpatient Department (OPD) emergency room.	Well-equipped and spacious unit; next to and separate from the CCU; in TB, male and female ward MSF and MoH staff do ward rounds and bedside training.	RAU becomes a unit and part of the CCU.	
<b>HR</b>	1 MSF clinician officer  1 nurse	1 MSF CO  1 nurse  1 counselor  1 MoH clinician (often absent as other responsibilities)	RAU: 1 MSF CO, 1 MSF nurse, 1 HDA  IPD wards: 3 pair of nurses/COs, MSF staff working in collaboration with MoH team	Same adding 1 MSF doctor who follows all patients	MoH staff with support of MSF on demand
<b>Service working hours</b>	Mon-Fri: 7h30-17h30	Mon-Fri: 7h30-17h30	Mon-Fri: 7h30-17h30	Mon-Fri: 7h30-17h30  Weekends: MSF doctor visits; MoH lab on call for urgent PoC	Mon-Sat: 7h30-21h00
<b>Trigger for change</b>	Mortality remained high.	RAU was overloaded due to the broad criteria defined to refer to the existing service.  Weak follow-up in IPD.	Poorly defined patient flow led to 50% of PLHIV admitted to IPD not benefitting from the RAU package.	MoH empowerment needed for sustainable long-term implementation of RAU.	
<b>Remarks/ events</b>	MSF support to the district hospital included: extra HR, gap filling of essential items of pharmacy and laboratory as well as fuel donations for ambulance and generator.		Female and TB ward rehabilitation were done.	Oct 2019: ART clinic at NDH started implementation of the AHD package.	
			Support infection prevention and control.	COVID-19 impacted all hospital activities from April to September 2020.	

**Despite all implementation efforts to reach all patients with criteria to be assessed in the RAU, several challenges persisted:**

- Patient flow in the hospital was not well defined and triage at OPD remained a weak point because of HR shortages, staff turnover, and constant training needs.
- Many patients who would have benefitted from RAU services before admission did not have access as there were different pathways of admission from OPD to IPD and limited working hours of the RAU.

- Due to national policy, TB treatment could not be initiated in the RAU. Only the TB office/TB ward does distribution of anti-TB treatment.
- Referrals and post-discharge mechanisms received attention but lacked a good communication system between hospital and PHC structures. For example, the hospital might be aware of and expecting patients referred by the health centers that would come by ambulance; however, the hospital was not aware of referrals expected to arrive if patients were not

being transported by ambulance. On the hospital side, patients were told during pre-discharge counseling about the need for appointments in PHC, but the PHCs were not informed of discharged patients and who should be followed.

- Turnaround time of some lab exams was long because of supply and maintenance issues (for example, with VL, Full Blood Count, and electrolytes.).

## Results

### Characteristics of patients admitted in NDH (2016–2020)

A total of 2,105 patients presenting with AHD were admitted between April 2016 and November 2020. Characteristics at admission in the hospital are presented in Table 10. Table 11 shows the evolution over time of the CD4 cell count at admission.

**Table 10: Characteristics of patients at admission**

Characteristics	N (2,305)	%
Sex		
Female	1,208	52.4
Total	2,305	
Age (median, IQ)	38 (30-46)	
ART status at admission		
Naïve	351	18.4
ART experienced	1,552	81.6
Total known ART status	1,903	82.6
Unknown	402	17.4
Patients with AHD (CD4 <200 with/or WHO Stage 3 or 4)	1,596	75.8
VL count		
≤40	26	9.3
>40-999	122	43.6
≥1,000	132	47.1
Total	280	



HDA assessing blood glucose of a patient in RAU.



The **median baseline CD4** of patients passing through the RAU increased over time. This was driven by a decrease in the proportion of patients with CD4 <100 cells/mm<sup>3</sup> from 36.5% to 21.3% at the end of the project. The proportion of patients with CD4 <200 cells/mm<sup>3</sup> decreased from less than 60% to less than 50%. An increase in the proportion of patients whose **ART status** was available was observed throughout the period. The number of naïve patients was higher amongst patients

who were directly admitted in IPD. This highlights the importance of good screening/triage before admission, in particular for patients not known on ART and newly diagnosed patients.

### RAU activity

Since July 2018, the RAU received a total of 1,733 PLHIV, of which 744 needed admissions. The number of patients seen in the RAU and its workload varied over time (Figure 5). We

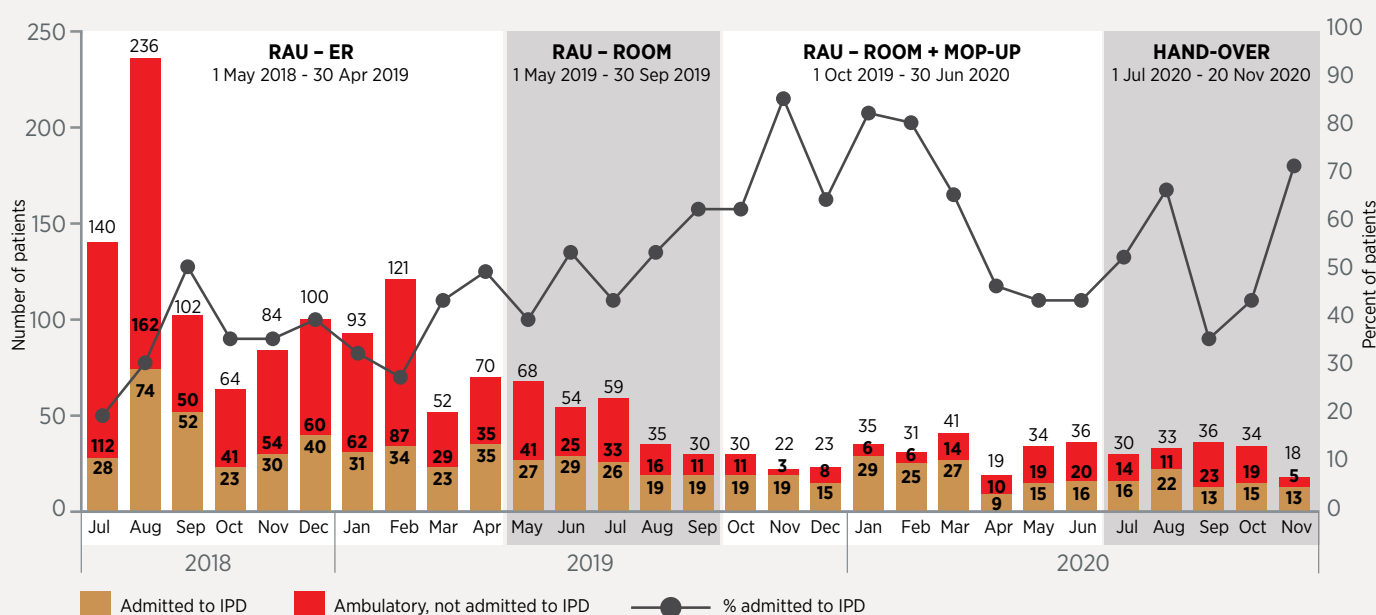
learned to implement more accurate criteria for referral to RAU with the aim of having more efficient services for patients who needed them. Implementing PoC testing at the NDH ART clinic (Oct 2019) meant a major change for the RAU, allowing it to act more as diagnostic and management unit for severely ill people rather than a screening unit for all patients who had not been previously screened in a PHC facility.

Table 11: CD4 cell count distribution at admission by period of implementation, 1 April 2016 – 20 November 2020, NDH, Malawi

	<b>Baseline</b>		<b>Early RAU</b>		<b>RAU-ER</b>		<b>RAU Room</b>		<b>RAU-Room + Mop-up</b>		<b>Hand-over</b>	
	<b>1 Apr 2016 – 31 Dec 2016</b>		<b>1 Jan 2017 – 30 Apr 2018</b>		<b>1 May 2018 – 30 Apr 2019</b>		<b>1 May 2019 – 31 Sep 2020</b>		<b>1 Oct 2019 – 30 Jun 2020</b>		<b>1 Jul 2020 – 20 Nov 2020</b>	
	<b>(N = 354)</b>		<b>(N=569)</b>		<b>(N=581)</b>		<b>(N=204)</b>		<b>(N=380)</b>		<b>(N=217)</b>	
<b>Total with CD4 information</b>	104		311		460		163		334		182	
<b>Median CD4 (IQR)</b>	147 (56, 314)		146 (47, 338)		216 (63, 433)		202 (85, 430)		228 (123, 402)		208 (97, 429)	
<b>CD4 &lt;100 cells/mm<sup>3</sup></b>	38	36.5%	125	40.2%	157	34.1%	47	28.8%	71	21.3%	46	25.3%
<b>CD4 100-200 cells/mm<sup>3</sup></b>	24	23.1%	58	18.6%	64	13.9%	32	19.6%	68	20.4%	43	23.6%
<b>CD4 &gt;200 cells/mm<sup>3</sup></b>	42	40.4%	128	41.2%	239	52.0%	84	51.5%	195	58.4%	93	51.1%

p<0.0001

Figure 5: Number of PLHIV arriving to RAU. RAU outcomes and percent admitted to IPD by month of arrival in the RAU, July 2018 – November 2020, NDH, Malawi.



Note: As the number of patients who died while in the RAU was low, these deaths have been included in the "Ambulatory, not admitted to IPD" category. The number of deaths in the RAU were as follows: August 2018, n=1; October 2018, n=1; October 2019, n=1.

The following Table 12 summarizes the criteria used by the PHC to refer to RAU.

**Table 12: Criteria used by the PHC to refer to RAU**

Referral criteria to RAU
<b>1. HIV-positive and one of the following danger signs:</b> <ul style="list-style-type: none"> <li>• Respiratory rate &gt;30/min</li> <li>• Saturation &lt;90%</li> <li>• Temperature &gt;39°C</li> <li>• Heart rate &gt;120/min</li> <li>• Systolic BP &lt;90 mmHg</li> <li>• Moderate or severe dehydration</li> <li>• Incapable of walking unaided</li> <li>• Altered mental state</li> <li>• Any other abnormal neurology, including paralysis or seizures</li> </ul>
<b>2. HIV-positive and one of the following:</b> <ul style="list-style-type: none"> <li>• Serum CrAg-positive</li> <li>• Need for investigations not available in clinic or more rapid turnaround time</li> <li>• Patient unable to return for repeated clinic visits within a few days</li> <li>• Patients not responding to outpatient treatment, such as antibiotics or anti-diarrheal treatment</li> <li>• Wasting, lethargy, feeling of 'unwell'</li> <li>• System-specific: <ul style="list-style-type: none"> <li>• Jaundice</li> <li>• Hemoptysis</li> <li>• Paleness (clinically severe anemia)</li> <li>• Chronic diarrhea</li> <li>• Abdominal distension/Ascites</li> <li>• Unexplained abdominal pain</li> <li>• Severe rash (blistering, mucous involvement, systemic symptoms)</li> </ul> </li> </ul>

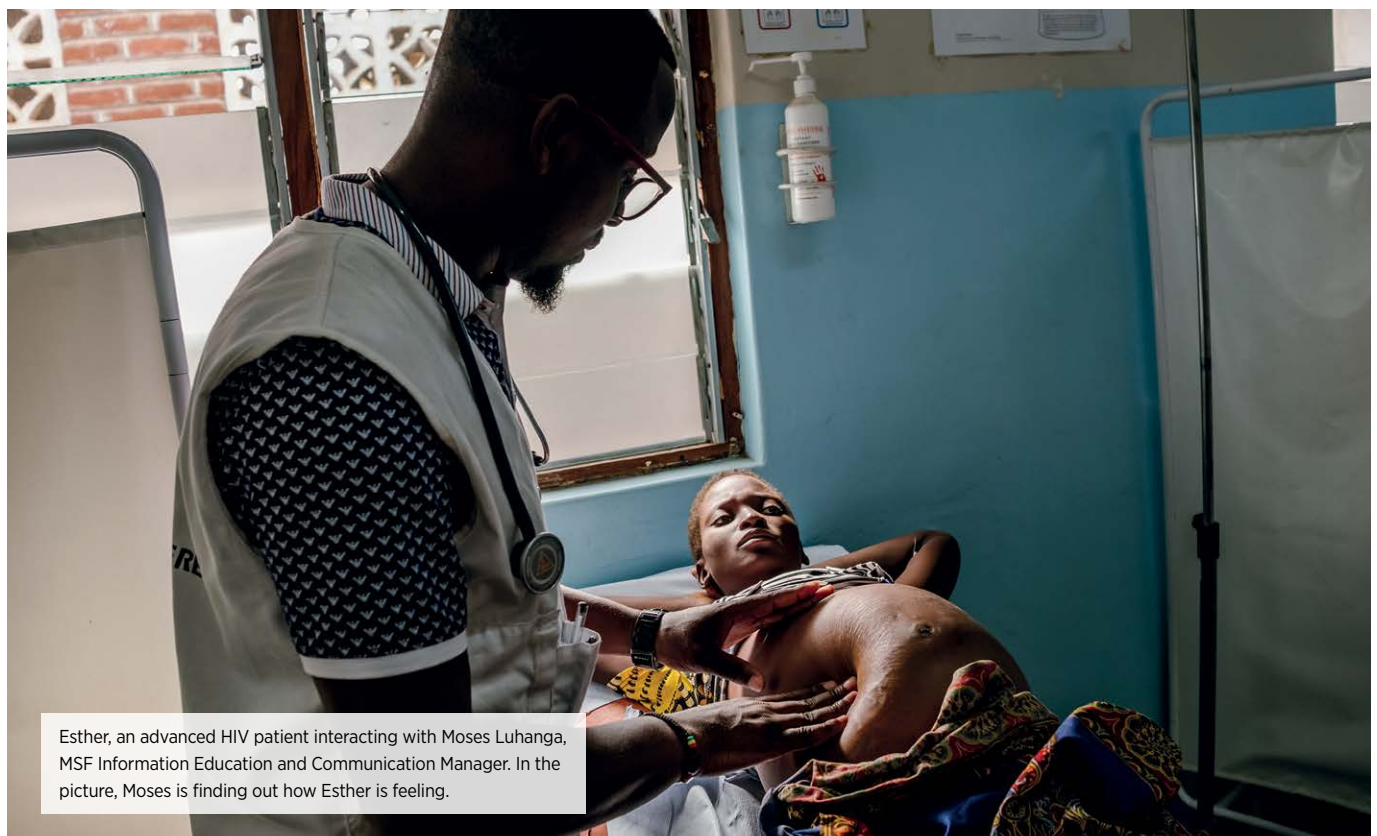
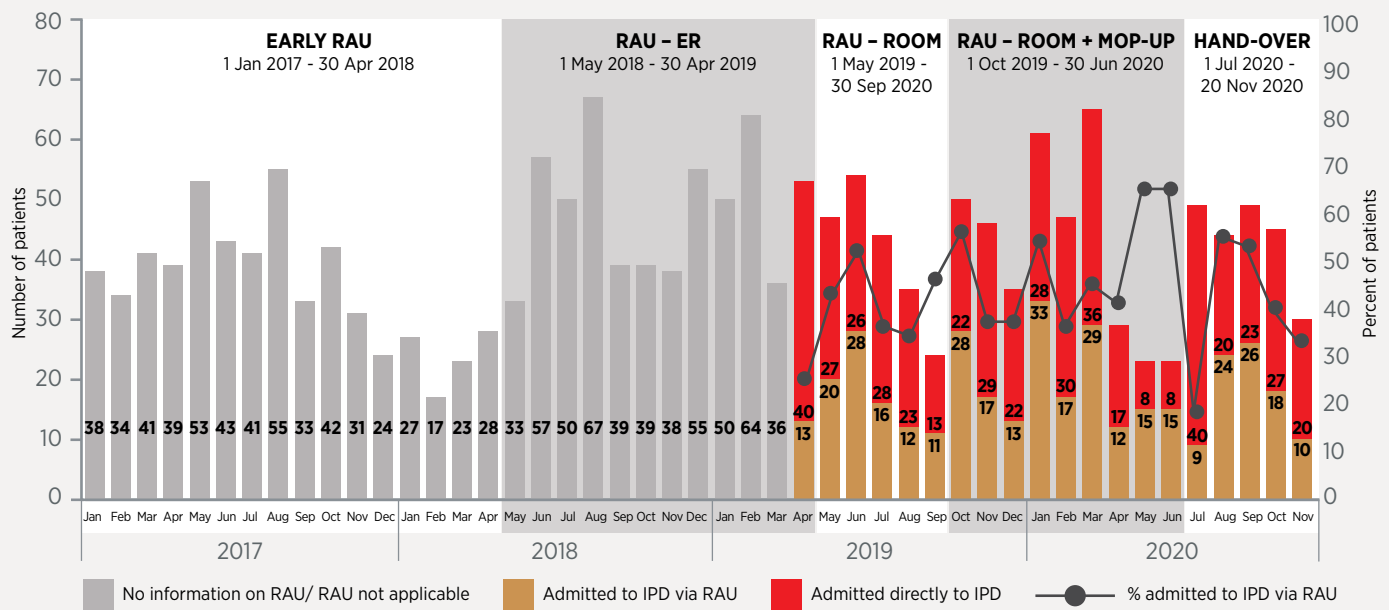


The trend of number of admissions remained almost the same over the years. Some periods of emergencies affected access of patients to hospital, like the floods in February 2019 and COVID-19 in April-June 2020. From mid-2019, admission at the entry door (through RAU

or directly to IPD) was recorded with the aim of answering whether the RAU model was available/accessible to all patients in need arriving at the hospital (Figure 6). Overall and consistently, only half of the admissions in IPD were done through RAU and the percent

of patients admitted through RAU remained stable over time. This might reveal the need to intervene in other areas of the hospital to ensure that all PLHIV should access the RAU package as the first step of their admission process.

Figure 6: Number of HIV+ inpatients admitted, and route of admission April 2016 – November 2020



Esther, an advanced HIV patient interacting with Moses Luhanga, MSF Information Education and Communication Manager. In the picture, Moses is finding out how Esther is feeling.

## Coverage of PoC testing (CD4, CrAg and TB-LAM)

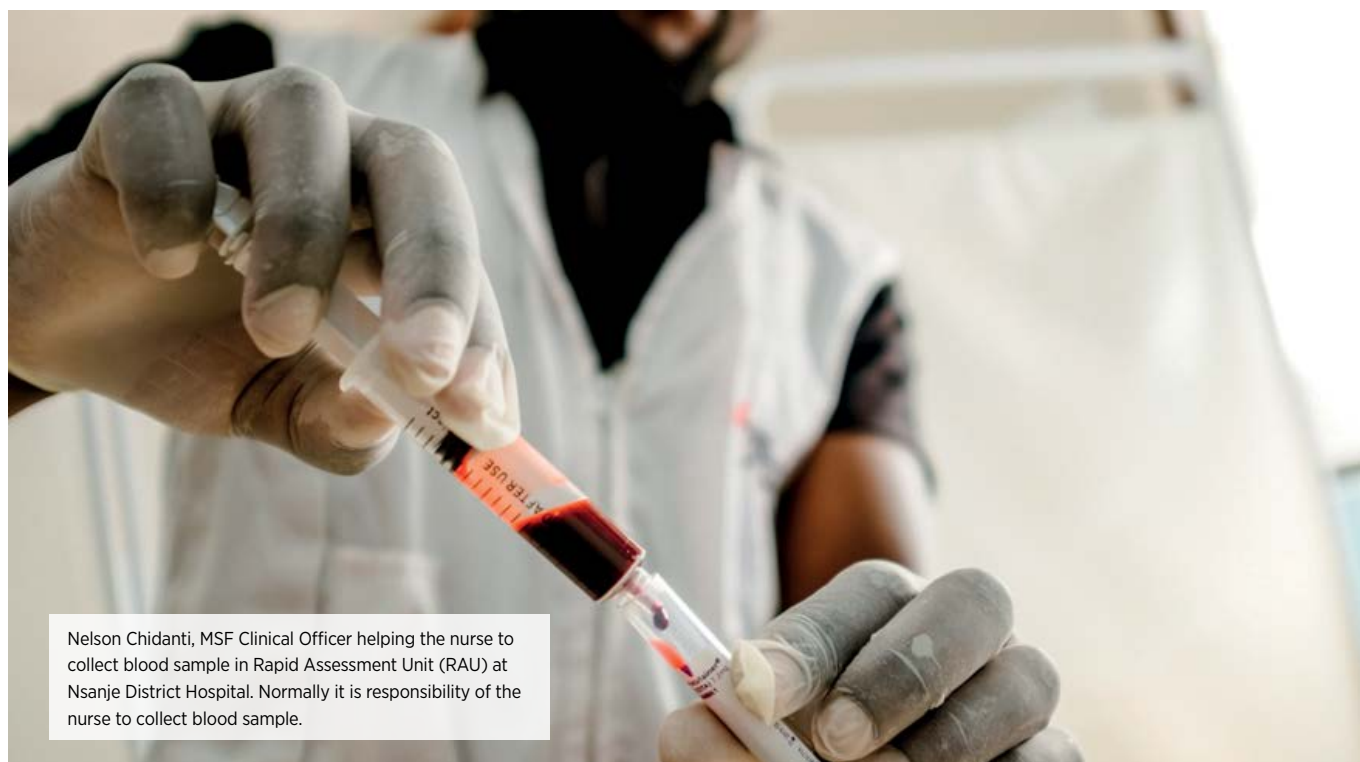
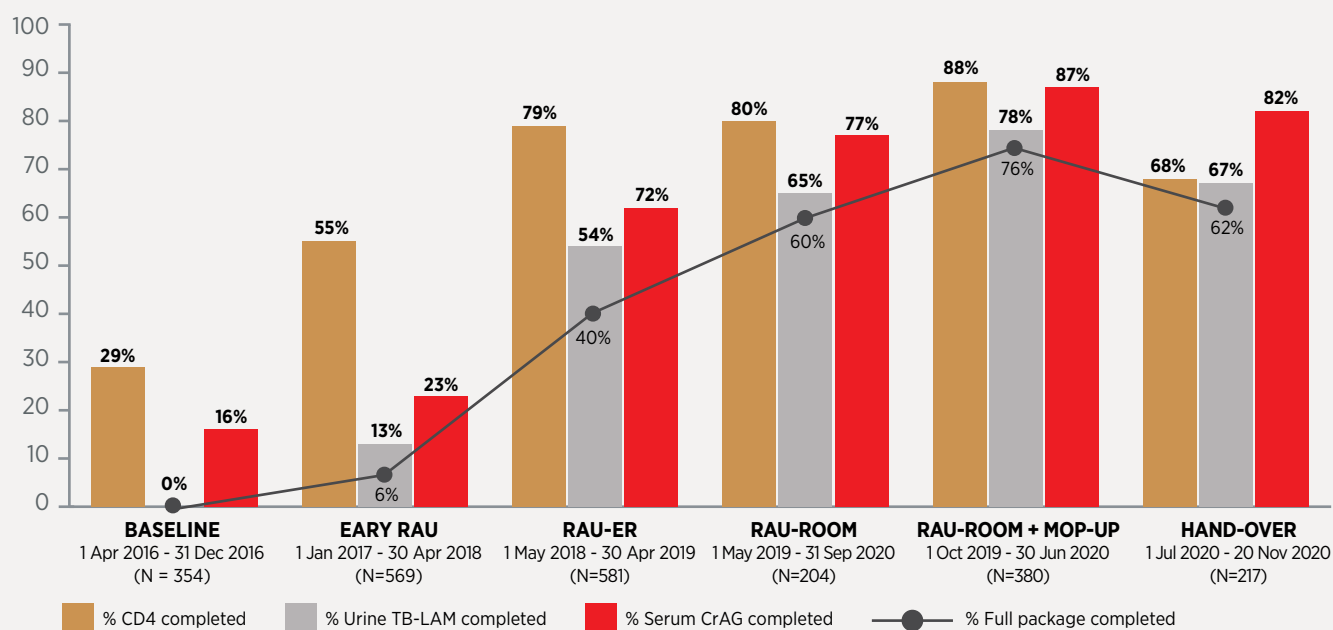
Until early 2018 the coverage of the three required tests for detection of AHD was rather low (Figure 7). This was also influenced by national policy recommendations. For example, in 2018 national policy recommendations adopted screening with

CrAg and TB-LAM for AHD; however, CD4 cell count was “not required”. In 2019, all three PoC tests became standard tests for PLHIV arriving at the RAU.

In 2020, a considerable number of patients did not have a CD4 test done upon admission. One potential explanation for this gap is linked to the fact that if patients were referred from a PHC where a PoC had

been done and if this was well documented in the referral note, then they would not get a repeated CD4 count at RAU. Additionally, from April 2020 on, there was a shortage in supply of CD4 cartridges (MSF stopped being the main supplier in December 2019) due to a higher level of consumption in the period February–March 2020.

Figure 7: CD4 count, urine TB-LAM and Serum CrAg coverage inpatient at RAU per period 1 April 2016 – 20 November 2020, NDH, Malawi





## PoC cascades

The coverage of serum CrAg improved over time, with rates of completion of >80%. However, the positivity of serum CrAg at

hospital was low. Throughout all periods we observed lower coverage of urine TB-LAM at PoC testing. An explanatory hypothesis is that urine could not be collected for some of the patients. Mechanisms to support all patients to

collect urine as soon as possible after arrival at the RAU should be explored (including follow-up of fluid balance in-out, offering water, IV fluids and, if unconscious, consider urine catheterization).

Figure 8: Serum CrAG Cascade, April 2016 - November 2020, NDH, Malawi

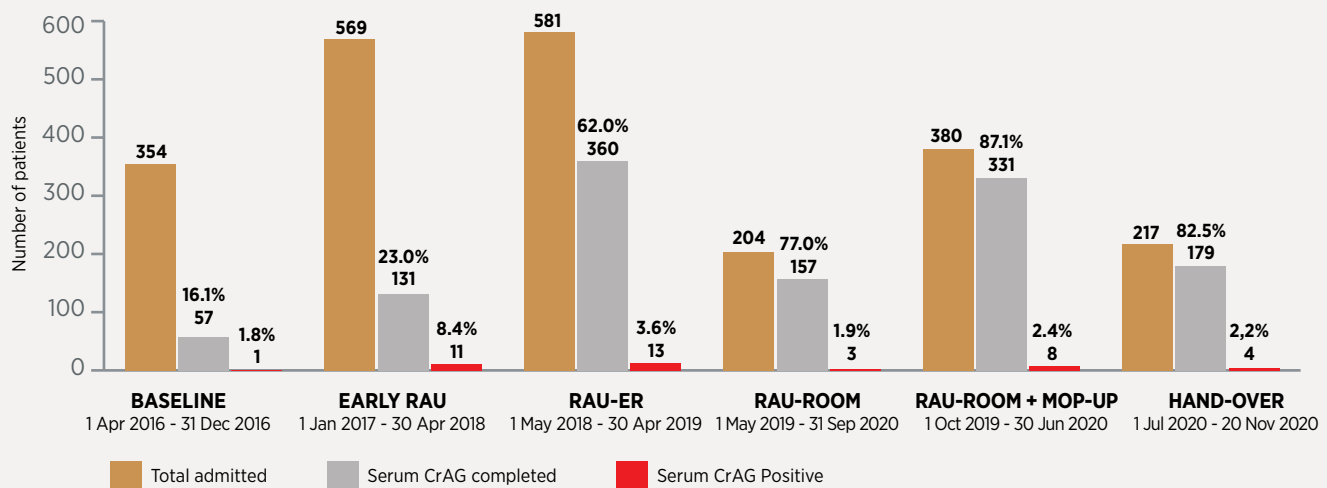
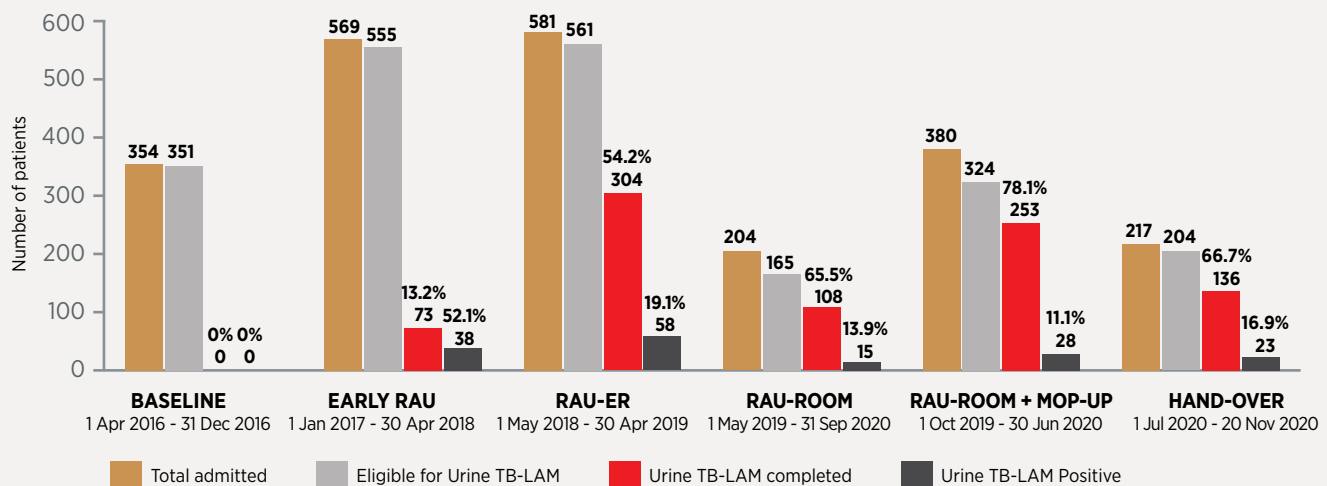


Figure 9: Urine TB-LAM Cascade, April 2016 - November 2020, NDH, Malawi



## Early TB diagnosis and treatment initiation

A file audit was carried out in December 2020 to evaluate whether there is a difference in management and outcome of hospitalized

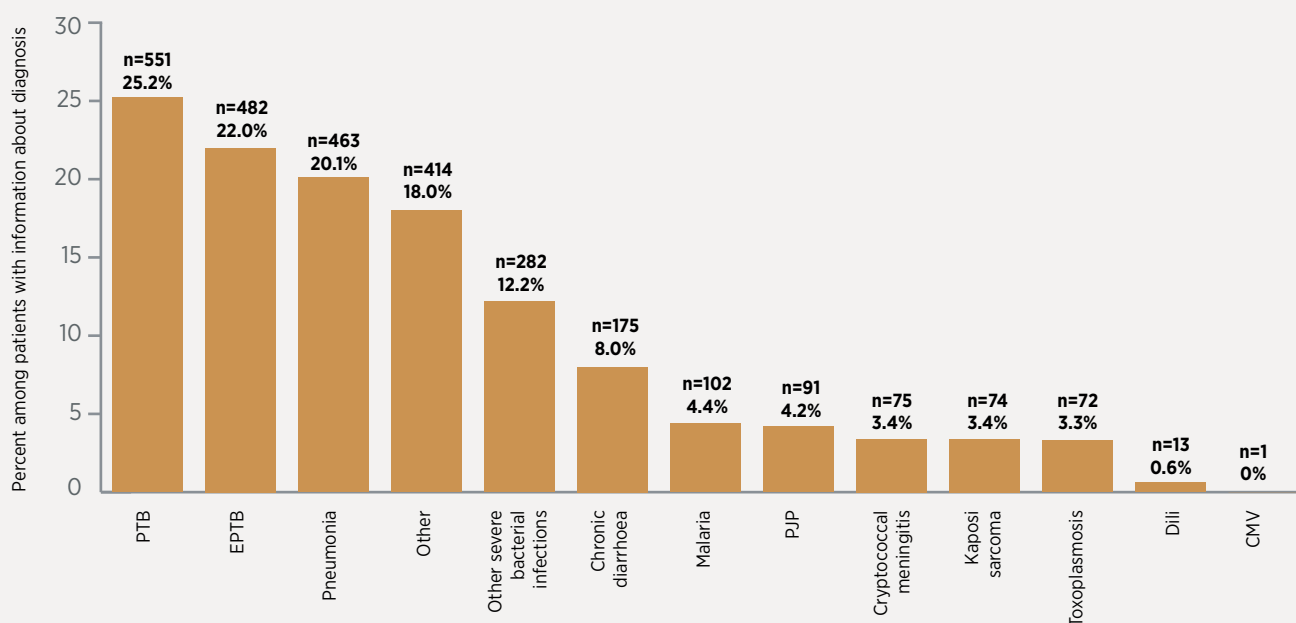
PLHIV between patients who received the RAU package before admission and those who did not. The main results are presented in Table 13. A total of 266 patients were discharged from the hospital between 1 October 2019 and 31 March 2020. Of them, 238 files (89.5%) were

located and analyzed. A total of 111 (46.6%) were of patients who had been admitted via the RAU, and 127 (53.4%) had been admitted directly to the IPD.

**Table 13: Same-day testing, diagnosis and treatment in patients admitted via RAU or directly to IPD. File review of patients who exited IPD Q4 2019 – Q1 2020.**

	Admitted through RAU (N=111)		Admitted directly to IPD (N=127)		Total (N=238)		
	n	(%)	n	(%)	n	(%)	p-value
<b>% Tested on the same day of admission</b>							
<b>CD4 done</b>	102	(91.9)	38	(29.9)	140	(58.8)	<0.001
<b>Urine TB-LAM done</b>	72	(76.6)	28	(24.6)	100	(48.1)	<0.001
<b>Serum CrAg done</b>	93	(83.8)	31	(24.4)	124	(52.1)	<0.001
<b>% Diagnosed and treated for TB on the same day of admission</b>							
<b>Diagnosis</b>	26	(89.7)	17	(62.9)	43	(76.7)	0.010
<b>Treatment initiation</b>	19	(65.5)	7	(25.9)	26	(46.4)	0.006

**Figure 10: Inpatient diagnoses, 1 April 2016 – 20 November 2020, NDH, Malawi**



The presentation and characteristics of PLHIV arriving with signs of AHD was similar in both groups (age, gender, initial CD4, and TB-LAM or CrAg positivity rates). One in four of all admitted patients were diagnosed with TB. The proportion of patients tested with TB-LAM within 24 hours after arrival at the hospital was higher for patients passing through RAU. And, the proportion of patients who started TB treatment after testing positive within the day of admission (24 hours) was also higher for patients passing through RAU. This was not the case when patients were admitted directly in IPD. In addition, in the earlier periods and models of RAU (early RAU and RAU-ER) the proportion of patients initiating TB treatment within the first 24 hours after diagnosis was much lower, 34% and 20% respectively.

The results from IPD show that important efforts were made to identify patients that were missed by the RAU (through provider initiated HIV testing of all new admissions and follow-up with AHD screening package by MoH/MSF joint team). However, patients arriving directly at the IPD would wait longer for the test and a confirmed diagnosis of AHD;

as a consequence, treatment was delayed.

With regards to IPD mortality rates for the patients included in the audit, 5 (4.6%) patients admitted through the RAU died, whereas 17 (13.4%) patients admitted directly to IPD died. A statistical significance ( $p < 0.012$ ) seems to show that RAU had an impact on reduction of mortality. However, we believe that this data should be interpreted with caution as, firstly, the numbers are very small and, secondly, the RAU missed 50% of the patients admitted in the IPD wards of the hospital. RAU had an impact for patients getting access to services; however, it lacked impact on 50% of the patients admitted directly to IPD without passing through RAU, hence reducing its potential impact on the overall hospitalized patient's care and (eventually) survival.

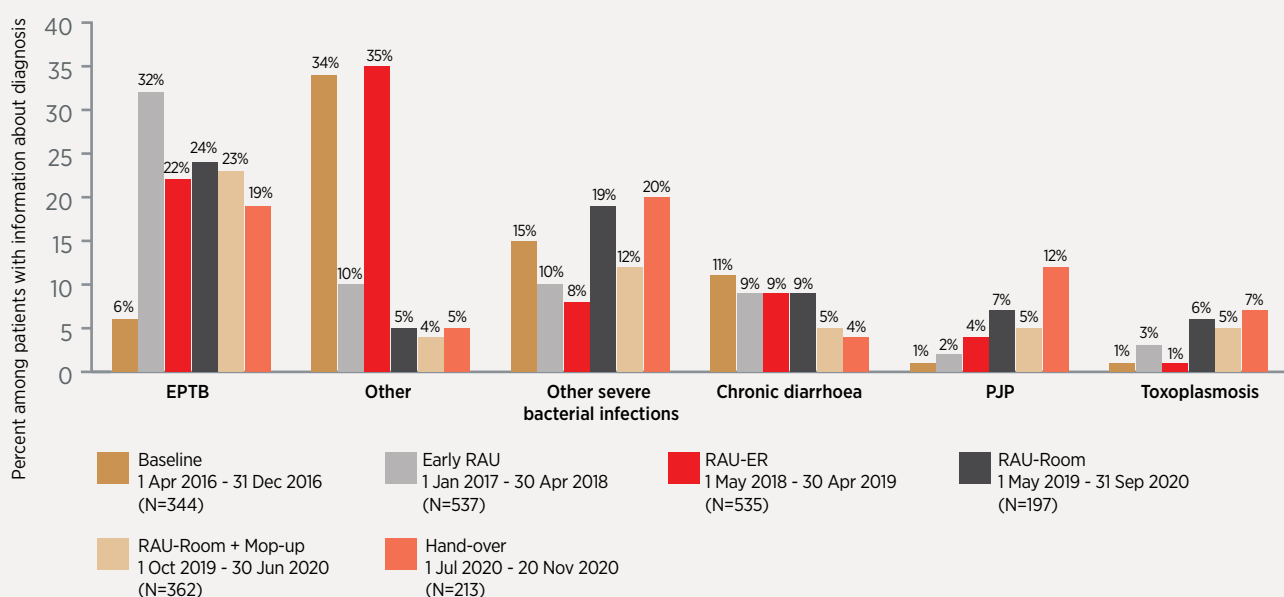
### Diagnostics findings

There were 2,795 diagnoses at exit recorded between April 2016 and November 2020. As diagnoses are not mutually exclusive and patients with AHD tend to have more than one diagnosis, we recorded the number of

diagnoses that patients would have. Throughout the entire period, 56% of patients had only one diagnosis, 28% had two diagnoses, and 13% had three or more diagnoses. Figure 10 shows the diagnoses made and their frequency. This observation points to the need to have M&E systems that can capture more than two diagnoses per patient.

The frequency of diagnosis made along with the evolution of the implementation of RAU changed over time. The frequency of diagnosing extra pulmonary tuberculosis was reduced, while the frequency of diagnosis of toxoplasmosis and Pneumocystic Jirovecii pneumonia (PJP) increased. This could point to the fact that the RAU had an effect of increasing awareness for clinicians to screen for and consider other severe OIs as possible diagnoses. In addition, the RAU included the implementation of a 10-diagnosis checklist to be reviewed for all patients, which might have contributed to improving the accuracy of diagnosis and reducing the proportion of "other" diagnosis that often would include non-specific conditions such as "anemia" rather than etiological diagnosis.

**Figure 11: Evolution of the frequency of diagnosis of EPTB, Toxoplasmosis, PJP, chronic diarrhoea and others, 1 April 2016 – 20 November 2020, NDH, Malawi**



## IPD mortality evolution

A sharp decrease in overall IPD mortality in NDH has been documented during the period. We observed a clear association with an increased CD4 cell count (cells/mm<sup>3</sup>) of patients presenting at admission (Figure 12).

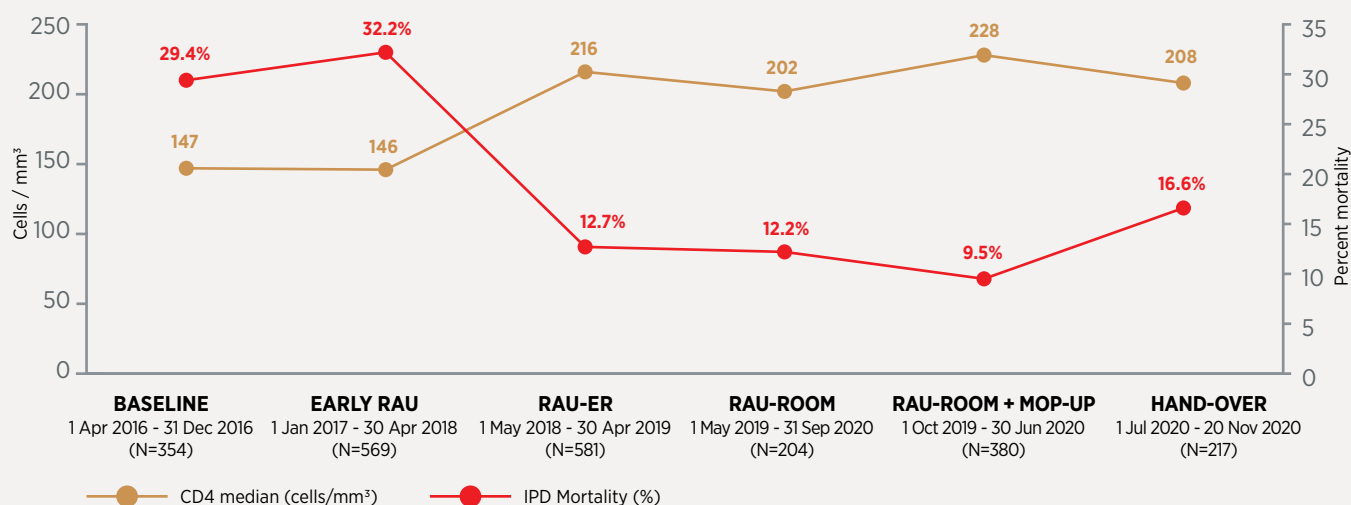
The mortality evolution and, in particular, its sharp decrease in 2017 should be interpreted as a result of a combination of factors linked to all the activities introduced in the project at all levels of health care and in the community. These factors include not only an improvement in knowledge, recognition, and confidence to diagnose and treat AHD through awareness raising, mentoring, and bedside training that might have led to improved diagnose of main OIs, especially TB, but also to the continuously improved coverage of ART in the district. Also, availability of prompt treatment

and management at PHC and earlier referral to hospital might have resulted in patients coming earlier to the hospital, which results in the increase of median CD4 of patients arriving to hospital. Increase of CD4 at admission could also be linked to a selection bias of the population sub-group living close to NDH as we have always seen very low referral rates from some PHCs. Other factors could be also considered, like general improved immunity of a population that over time has better access to ART, improved awareness and knowledge in the community, etc. Nevertheless, early disease recognition and management plus treatment initiation remain key factors at all levels.

A note should be made on the impact of COVID-19 on the program and patients, and the concurrent reduction of CD4 cell count and increase in mortality during the last period. During the first COVID wave (April

2020), patients arrived later or had limited access to health care. The community mentoring activities were put on stand-by, and expert clients were not allowed to continue fieldwork. Some patients with HIV felt stigmatized when they were asked to stay away from hospitals as they were at high risk of severe COVID. At the level of the healthcare facilities, government's recommendations aimed at reducing workload in the laboratories and minimizing the number of patients at these facilities (to prevent risk of exposure to COVID but also to reduce expected collapse of facilities with high influx of patients with COVID) meant that routine milestone exams (like HIV RNA Viral Load (or VL)) were put on hold. When patients started to feel more comfortable to come back to the hospital, some were late. This could explain the CD4 and mortality evolution observed over the last period.

Figure 12: Trend of the IPD mortality rate and median CD4 count, 1 April 2016 – 20 November 2020, NDH, Malawi





## Did RAU improve care for patients with AHD? Challenges and lessons learned

RAU appears to lead to higher rates of same-day treatment initiation of OIs (in particular TB) and lower mortality if seen in RAU before admission. However, not all patients admitted had access to RAU. Almost 50% of the patients admitted in IPD did so without having benefited from the RAU package. Despite efforts to improve referral to RAU and attempts to capture patients in IPD who missed the RAU, this proportion remained at around 25% at the end of the implementation period. Ideally and for a meaningful impact, all patients with HIV infection arriving at the hospital should benefit from the package offered by the RAU, whether offered in a physically dedicated space or as a package to be performed in IPD immediately at admission or upon arrival of the patient at the hospital.

### Additional main challenges faced were related to:

- RAU working hours: RAU was closed at nights and during the weekends; any attempts to expand that would have required more HR that was not available.
- Lack of clarity regarding the patient flow.
- Weak hospital triage and referral to the RAU.
- Lack of patient/clinician awareness to access the RAU.

### Lessons learned to address those challenges:

- **To increase the number of patients screened for AHD through a RAU dedicated space:**
  - Improve OPD triage before admission.
  - Improve access to voluntary counseling and testing in OPD.
  - Consider opening RAU 24/7 or at least during the busiest hours of the weekend.
  - Improve internal patient flow: clarify roles and responsibilities of each department, determine what package to offer at each service and where to refer (e.g. testing + referral to RAU vs. testing + referral to IPD).
  - Improve external patient flow: institute clear procedures on how patients from outside hospital or other HC facilities can be referred.
- **To increase rapid diagnosis, the main PoC tests should be available 24/7 regardless of RAU opening hours:**
  - Implement a mobile package (a trolley with the PoC and responsibilities allocated to staff is a practical solution) to be used when needed.
  - Integrate the PoC AHD tests as an emergency test, done by a lab technician who is on call.

- Consider novel strategies and new real PoC technologies (e.g. Visitec® as PoC for CD4).
- Provide an orientation for all hospital staff on the flow of patients, algorithms and how to treat newly admitted patients.
- Introduce health promotion activities to raise AHD awareness at hospital level, e.g. in the OPD waiting areas.
- **To increase prompt treatment:**
  - Ensure sufficient and trained clinical HR in the RAU, the wards, and OPD.
  - Make available and accessible small amounts of all OI drugs to start treatment at the RAU and IPD.

***“Although hope was sometimes far, the continuous support of staff in RAU helped me keeping up to survive. They made me feel comfortable to come back and look for help when I needed it.”***

*Grace, a young woman diagnosed with AHD in 2019, was hospitalised several times in Nsanje and visited the RAU regularly.*



# CONCLUSION

**Preventing, treating and surviving AHD is possible with timely detection, diagnosis and immediate treatment of patients at all levels of care.**

- **Community awareness and engagement** is the cornerstone of success to reach people in the remote areas of Nsanje. Using different existing structures has proven most efficient: know your community structures and work with them.
- **The lives of PLHIV and AHD can be saved** by developing awareness for early detection and management in PHCs and ensuring the availability of basic packages for AHD in referral hospitals.
- **Task-shifting of PoC tests** allows scale-up of diagnosis and might reduce the workload in busy facilities' settings, **and will have most value if** smooth follow-up, clinical management, and referral, if needed, are equally ensured.
- **Implementation of** a package of care for AHD at referral level leads to prompt management and treatment initiation of patients in need. However, challenges remain to ensure that the hospital organization integrates that package in the provision of health care.
- **All links matter: Referral and post-discharge follow-up of patients in the continuum of care** need to be well defined to be able to link patients to the required levels of care.
- **Responsible leadership, adequate resources, and capacity-building** are needed for engaging healthcare workers in remote and unattractive working areas at all healthcare levels. An active and supportive district health management team, sufficient supplies and human resources, and the continued mentoring and monitoring of activities and results will make a difference in the circle of care for patients with AHD.

# SUPPORT TO CONTINUE THE CIRCLE OF CARE FOR PATIENTS WITH AHD

## CAPITALISATION & LESSONS LEARNT

1. Short Movie in English: "Circle of Care" for AHD in Nsanje district, 2019  
<https://youtu.be/ciWRzPRVsNs>
2. Short Movie in Chichewa: "Circle of Care" for AHD in Nsanje district, 2019  
<https://youtu.be/Tm7lotU216A>
3. Testimonies personal stories: Austin, Grace, Lita, Manfred  
<https://youtu.be/VYYU6X0U-t8>  
<https://youtu.be/EoAodrklfOY>  
<https://www.youtube.com/watch?v=pT-3uc1JhJ8>  
<https://youtu.be/GocItEj8ONs>
4. Capitalization presentation on lessons learnt, The circle of care – all links matter – Nsanje  
<https://drive.google.com/file/d/1efgPEGQMo-kVvj7QkfoRaWCUKQtw30D6/view?usp=sharing>

3. Malawi, 2019 Policy updates (addendum to the 4th edition of the Malawi Integrated Guidelines and SOP's)  
<https://drive.google.com/file/d/1MV-gFhglJ4QtSA10r01-LOGnYUhfB21v/view?usp=sharing>
4. Malawi, TB guidelines, 2018  
[https://drive.google.com/file/d/1Z7xycZ7y\\_wYcT12WRCjn\\_cyjtU\\_\\_wVBf/view?usp=sharing](https://drive.google.com/file/d/1Z7xycZ7y_wYcT12WRCjn_cyjtU__wVBf/view?usp=sharing)
5. MSF-SAMU, "No time to lose: Detect, treat and prevent AIDS" 2018 (MSF)  
[https://samumf.org/sites/default/files/2019-12/no-time-to-lose\\_-advanced-hiv-report.pdf](https://samumf.org/sites/default/files/2019-12/no-time-to-lose_-advanced-hiv-report.pdf)
6. WHO, Guidelines for managing AHD and rapid initiation of ARV therapy, 2017  
<https://www.who.int/publications/i/item/9789241550062>

Emmanuel Fajardo, Anafi Mataka, Elisabeth Szumilin, Bernhard Kerschberger, Gilles Van Cutsem, Tom Ellman.  
[https://doi.org/10.1016/S2352-3018\(20\)30101-6](https://doi.org/10.1016/S2352-3018(20)30101-6)  
<https://www.sciencedirect.com/science/article/abs/pii/S2352301820301016>

3. Diagnostic performance and usability of the VISITECT CD4 semi-quantitative test for advanced HIV disease screening. Ndlovu Z, Massaquoi L, Bangwen NE, Batumba JN, Bora RU, et al. (2020) Diagnostic performance and usability of the VISITECT CD4 semi-quantitative test for advanced HIV disease screening. PLOS ONE 15(4): e0230453.  
<https://doi.org/10.1371/journal.pone.0230453>  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0230453>
4. Result of the "Lost to Follow-up Survey" (2018)  
[https://drive.google.com/file/d/1qNjA\\_TVNESNnec7c5egZPbBC5ZdmHS\\_/view?usp=sharing](https://drive.google.com/file/d/1qNjA_TVNESNnec7c5egZPbBC5ZdmHS_/view?usp=sharing)
5. POSTER IAS; Is hospital care for HIV and TB patients an outdated program  
<https://drive.google.com/file/d/1rJhHYBgckTCV KHzbDqYTMjW7mJElI9w/view?usp=sharing>
6. Overview of activities, Nsanje project  
[https://drive.google.com/file/d/1XLZ1ahU03eIVt xEfaU\\_7zxXfIN4TNeut/view?usp=sharing](https://drive.google.com/file/d/1XLZ1ahU03eIVt xEfaU_7zxXfIN4TNeut/view?usp=sharing)

## GUIDELINES AND SOPs

1. MSF-SAMU; 'MSFHIV/TB clinical guide for primary care' (2018, updates 2021)  
<https://samumf.org/en/resources/msf-hivtb-clinical-guide-2018>
2. MSF-SAMU; HIV/TB guide hospital level (2020)  
[https://samumf.org/sites/default/files/2021-02/Updated%20Corrections%20HIVTB%20Hospital%20Level%20Guide\\_English\\_November%202020.pdf](https://samumf.org/sites/default/files/2021-02/Updated%20Corrections%20HIVTB%20Hospital%20Level%20Guide_English_November%202020.pdf)

## RESEARCH AND PUBLICATION AND REPORTS (specific for AHD in Nsanje)

1. Population-Based HIV Impact Study Nsanje, Malawi. 2016, EPICENTRE (final report 2019)  
<https://drive.google.com/file/d/1timaXSA41liOhT-VsPmTvGNqOYgyT159/view?usp=sharing>
2. Framework for the implementation of advanced HIV disease diagnostics in sub-Saharan Africa: programmatic perspectives. Zibusiso Ndlovu, Rosie Burton, Rosanna Stewart, Helen Bygrave, Teri Roberts,

## TOOLS AND RESOURCES

### A. COMMUNITY AND PATIENT SUPPORT

1. Leaflet 'danger signs of AHD', MSF  
[https://samumfsf.org/sites/default/files/2019-07/Danger%20signs\\_leaflet\\_V2.pdf](https://samumfsf.org/sites/default/files/2019-07/Danger%20signs_leaflet_V2.pdf)
2. Welcome back training package  
<https://drive.google.com/file/d/1HAGD1OYCwg6oBLAQJMEo52j71XffQA65/view?usp=sharing>
3. ART initiation counseling  
[https://drive.google.com/file/d/1\\_6Lxmd6zYOrMxb0TuYPJAK-fdO4qVec/view?usp=sharing](https://drive.google.com/file/d/1_6Lxmd6zYOrMxb0TuYPJAK-fdO4qVec/view?usp=sharing)
4. Missed appointment counseling  
[https://drive.google.com/file/d/1gPd\\_CiP6gF9pUMX24F0srGWwOVsQl8gR/view?usp=sharing](https://drive.google.com/file/d/1gPd_CiP6gF9pUMX24F0srGWwOVsQl8gR/view?usp=sharing)
5. Intensive adherence counseling  
[https://drive.google.com/file/d/1V79kznMWocBLYEv26LPybNIIUF8l\\_Gg6/view?usp=sharing](https://drive.google.com/file/d/1V79kznMWocBLYEv26LPybNIIUF8l_Gg6/view?usp=sharing)
6. Advanced HIV disease: patient education and counseling  
[https://samumfsf.org/sites/default/files/2019-07/AHD\\_PCS\\_Description.pdf](https://samumfsf.org/sites/default/files/2019-07/AHD_PCS_Description.pdf)  
[https://samumfsf.org/sites/default/files/2019-07/AHD\\_PCS\\_Annexes\\_Tools.pdf](https://samumfsf.org/sites/default/files/2019-07/AHD_PCS_Annexes_Tools.pdf)
7. Child disclosure counseling  
[https://drive.google.com/file/d/1uoCgiBnX3jYLYKPCg9i3a5Xf\\_krhJdmE/view?usp=sharing](https://drive.google.com/file/d/1uoCgiBnX3jYLYKPCg9i3a5Xf_krhJdmE/view?usp=sharing)
8. How to deliver health talks  
[https://drive.google.com/file/d/1g6FhPRHONC91bjZXO\\_0cJi9ZYD\\_fEm3m/view?usp=sharing](https://drive.google.com/file/d/1g6FhPRHONC91bjZXO_0cJi9ZYD_fEm3m/view?usp=sharing)
9. Welcome back approach counseling  
<https://drive.google.com/file/d/1GvL1atHWlwnMAS8qDJeZXrg1skGXy2W-/view?usp=sharing>
10. Adherence counseling – training  
<https://drive.google.com/file/d/1tipAXwfofS4TRsFNCqQVIWT49dRzMM19/view?usp=sharing>
11. CAG group card  
<https://drive.google.com/file/d/1miv024sdXxZbjswFq8hvYrQsAeaC1dOJ/view?usp=sharing>
12. CAG register  
<https://drive.google.com/file/d/1y1LaCyTqXzyhOTUvEyX6wfx5VmRbJ3Nu/view?usp=sharing>

13. SOP viral load for CAG members  
<https://drive.google.com/file/d/1-hLaJ5bSDHtuhq2WLTh5fjzbXtGzm2q/view?usp=sharing>

### B. HEALTH CENTRES

1. Initial facility assessment tool  
[https://drive.google.com/file/d/1\\_LfgIOj8RQsMJ\\_iqZdxTqgJnG1wcAhP9/view?usp=sharing](https://drive.google.com/file/d/1_LfgIOj8RQsMJ_iqZdxTqgJnG1wcAhP9/view?usp=sharing)
2. Pont of care algorithm and register  
<https://drive.google.com/file/d/10FMjW6uzZyvoH7EYXFOYIMqNHprdCGcc/view?usp=sharing>
3. Mentoring program AHD  
<https://drive.google.com/file/d/1jqaoausl7nevB6-lAw8yDitgdz-pcWLh/view?usp=sharing>
4. Mentee dashboard  
<https://drive.google.com/file/d/1mjTu7DeAldSY-wiKcejML2ppsX23ZcGg/view?usp=sharing>
5. Mentoring program overview TB-HIV  
[https://drive.google.com/file/d/1-8D5FQT4QoJ\\_YhFGwNGcEud9sJcVDUI/view?usp=sharing](https://drive.google.com/file/d/1-8D5FQT4QoJ_YhFGwNGcEud9sJcVDUI/view?usp=sharing)
6. Mentors weekly meeting  
<https://drive.google.com/file/d/1XYhy7BuyZYfDqfQuLxAtsU2RCFcXxWr/view?usp=sharing>
7. Patient support session guide/flipchart  
<https://drive.google.com/file/d/18XFA9EiOeymGj1HioWbdNSctzow5mROW/view?usp=sharing>
8. District Dashboard Q1-Q3 2020  
<https://drive.google.com/file/d/1ZEJzJHNM7nMGM9f71gTV00yXIWWFao/view?usp=sharing>
9. Post discharge SOP  
<https://drive.google.com/file/d/10AIBKy64Qhsk7BpTqYQJt1YnwRg9JJ2u/view?usp=sharing>
10. Community tracing SOP  
<https://drive.google.com/file/d/11lwkybbpTNOXotppve9Vt4-myOYnEfEh/view?usp=sharing>
11. Patient referral form  
<https://drive.google.com/file/d/17oURYpXJA-rVtz6FhJhZeJMUwvmZyU4H/view?usp=sharing>
12. Enhanced care register  
<https://drive.google.com/file/d/1252aGAcOWCW0jRvalr7SW-lwy8pVhp-P/view?usp=sharing>

13. Mentee certificate (sample)  
<https://drive.google.com/file/d/1q99N1JO5SKAxwV6acLqqrDfnHpiJR3sS/view?usp=sharing>

### C. HOSPITAL

1. Rapid Assessment Unit register  
[https://drive.google.com/file/d/18B5xgH4\\_DrcndQTID427T1A6xwxn\\_LeQ/view?usp=sharing](https://drive.google.com/file/d/18B5xgH4_DrcndQTID427T1A6xwxn_LeQ/view?usp=sharing)
2. IPD form  
<https://drive.google.com/file/d/1Mg46dtceev905yCq4fnSgpiTrQZVxKin/view?usp=sharing>
3. Flowchart triage  
<https://drive.google.com/file/d/1yXYGqqlbFcoRf4Ghvu0tqIDIRKXqW4cW/view?usp=sharing>
4. Orientation poster for wards  
[https://drive.google.com/file/d/1KjRiYtQ\\_ItiHF\\_sRyzW6pkivClqT\\_32j/view?usp=sharing](https://drive.google.com/file/d/1KjRiYtQ_ItiHF_sRyzW6pkivClqT_32j/view?usp=sharing)
5. Training of PoC test certificate  
[https://drive.google.com/file/d/1GR\\_orEp6xC83WWDG5Ghv7o6kZQLSMPqv/view?usp=sharing](https://drive.google.com/file/d/1GR_orEp6xC83WWDG5Ghv7o6kZQLSMPqv/view?usp=sharing)
6. Nurses training plan  
[https://drive.google.com/file/d/13X\\_hNnGg\\_1t4zDODIBp4X7nZoH4yo0ed/view?usp=sharing](https://drive.google.com/file/d/13X_hNnGg_1t4zDODIBp4X7nZoH4yo0ed/view?usp=sharing)
7. 2<sup>nd</sup> line PEC guide  
<https://drive.google.com/file/d/1I7Mi7ftMzQN-JDpTqzklkSobpJJYMIZH/view?usp=sharing>

### D. LABORATORY

1. Quality control TB-LAM  
<https://drive.google.com/file/d/1NW0QM0Q2QWgnsu8Mkklz9HYWexuY42/view?usp=sharing>
2. Quality control PIMA  
<https://drive.google.com/file/d/1yKiV4DTJsrQgepVJwAzZoW2qj7FaVxbD/view?usp=sharing>
3. Quality control CrAg  
<https://drive.google.com/file/d/1g-rd5ytDQ8glqB9BZclbgOTwbDiOIHMm/view?usp=sharing>
4. Supervision tool lay cadres in health centres  
[https://drive.google.com/file/d/1tj4QFa\\_RB0oiAh92aCV-iIHxj01u0\\_8/view?usp=sharing](https://drive.google.com/file/d/1tj4QFa_RB0oiAh92aCV-iIHxj01u0_8/view?usp=sharing)

## CONTACT:

Esther C. Casas  
esther.casas@joburg.msf.org

Eric Goemaere  
eric.goemaere@joburg.msf.org





