

The Chronic Diseases Clinic of Ifakara (CDCI) and the Kilombero and Ulanga Antiretroviral Cohort Study (KIULARCO) at the St. Francis Referral Hospital

Annual Report 2023

A collaboration between

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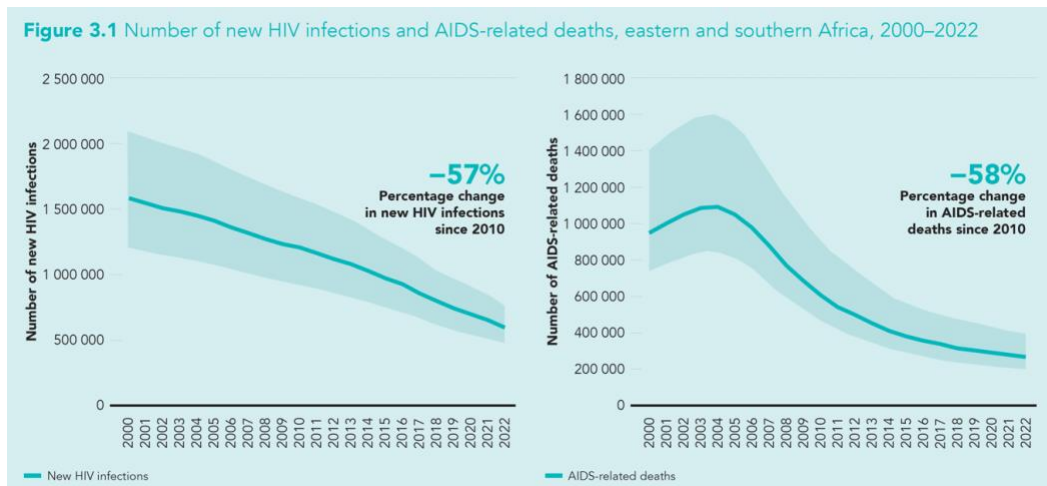
Prof. Dr. med. Maja Weisser, Dr. Dr. Ezekiel Luoga
Ifakara, 28.01.2024

INDEX

I SUMMARY	3
HIGHLIGHTS AND ACHIEVEMENTS OF 2022AT CDCI	4
II PATIENT NUMBERS	5
HIV TESTING AT SFRRH 2023	5
PATIENT ENROLMENT AT THE CDCI	6
<i>Numbers from the National AIDS Control Program (NACP) Database 1.1. - 31.12.2023</i>	6
<i>Numbers from KIULARCO (openMRS) until December 31st, 2023</i>	6
	8
III STAFF OF THE CDCI	8
IV INFRASTRUCTURE	8
IV ORGANIZATION OF THE CLINIC	9
CLINICAL ACTIVITIES	9
<i>HIV testing & counselling services</i>	9
<i>Medical care – routine procedures</i>	9
<i>Pharmacy</i>	10
<i>Reducing attrition and improving Retention in care</i>	10
<i>CDCI activities within SFRRH Wards</i>	10
<i>Integration of HIV and Tuberculosis Activities</i>	10
<i>Integration of the CDCI with the antenatal and under-five clinic of SFRRH</i>	11
<i>Integration of Malnutrition Services</i>	11
<i>Cervical Cancer Screening</i>	11
<i>Community Activities</i>	12
LABORATORY ACTIVITIES	12
<i>Monitoring of HIV-Therapy and Screening and Diagnosis of Opportunistic Infections</i>	12
<i>Hub for Viral load Testing</i>	12
<i>Early Infant Diagnosis</i>	12
<i>Quality management system</i>	13
V RESEARCH ACTIVITIES	13
RESEARCH AREAS	13
DATA MANAGEMENT AND STATISTICAL ANALYSES	13
RUNNING TRIALS	13
PUBLICATIONS	14
CONFERENCES	14
VI TRAINING ACTIVITIES	15
VII COLLABORATIONS/IMPORTANT VISITS	16
VII FUNDING SITUATION/BUDGET	16
YEARLY BUDGET	16
VIII CONCLUSIONS	16

I Summary

Despite huge successes of global HIV programs Eastern and Southern Africa continue to have the highest burden of new HIV infections worldwide - 500,000 out of 1.3 millions globally in 2022 (UNAIDS report 2023). Treatment coverage rates reaches 83%, fueling the still high mortality accounting for almost half of all HIV-associated deaths worldwide (260,000 deaths in 2022).



According to the UNAIDS report 2023, in Tanzania, the HIV/AIDS incidence has further decreased to 0.54/1,000 (32,000 new infections in 2022) and the number of AIDS-related deaths has dropped to a third compared to 2010, but remains unacceptably high with 22,000 people who died of AIDS. The treatment cascade according to the 95%-95%-95% targets of the UNAIDS has improved dramatically: 95% of people know their HIV status (1st 95); 94% are in care (2nd 95) and 92% are virally suppressed (3rd 95). Poorest numbers of the cascade are reported for children (0-14years) with 73% - 73% - 67%.

The Chronic Diseases Clinic of Ifakara (CDCI) is uninterruptedly delivering services to patients as the Care and Treatment Center (CTC) of the St. Francis Regional Referral Hospital (SFRRH) in Ifakara, Morogoro since 2005. It is as joint project of the Swiss Tropical and Public Health Institute, the Ifakara Health Institute, the SFRRH and the University Hospital Basel, and works in close collaboration with the district and regional authorities, the National AIDS program and the implementing partners, currently USAID Afya Yangu. CDCI offers HIV testing, enrolment into care and same day start of antiretroviral treatment ('test and treat'). CDCI provides care for in- and outpatients with an HIV- and or tuberculosis infection according to the Tanzanian guidelines. The current viral suppression rate at the CDCI is 88% in adults (*D. Mnzava, BM ID 2022 in press*). The IHI laboratory functions as a referral hub in viral load and early infant PCR testing for the 4 surrounding districts in the Kilombero valley.

The Kilombero and Ulanga Antiretroviral Cohort (KIULARCO) – including consenting patients attending the CDCI - has become one of the longest-standing cohorts in Eastern Africa with a follow-up of up to 17 years. The prospectively collected data from routine care contain demographic, clinical information and storage of blood samples. Close to 13,000 PLHIV have been enrolled - 3'800 are under active care. Each year 6-8 manuscripts are published from KIULARCO. The third pillar of CDCI is training and capacity building of young medical doctors, nurses, laboratory scientists and epidemiologists, and is happening on a daily basis in clinical, quality and research meetings. On top, for many collaborators, the CDCI is a stepping stone towards formal trainings, such as master and PhD programs and medical specialization.

Highlights and achievements of 2023 at CDCI

Clinic

- Dr. Ezekiel Luoga is leading the CDCI. Dr. Bernard Kivuma was his deputy throughout the year. The One Stop Clinic has been led by Dr. Lilian Moshi
- Improving integrated care within the close partnership with the Heart and Lung Clinic at the SFRRH
- Organization of World AIDS Day Meeting together with MoH, USAID Afya yangu, Nacofa, Kizazi hodari at Msolwa, Ifakara
- St Francis Referral Hospital has been upgraded to a Regional Referral Hospital (SFRRH)

Training

- **PhD:** Dr. Robert Ndege 2nd year at SwissTPH, A. Ntamatungiro finalized at CARTA University
- **Master:** Dr. Ezekiel Luoga completed online PH Master at Suffolk University, Olivia Kitau completed PH Master at Limerick University, Dr. Herieth Wilson completed PH Master at University of Dublin, Dr. Lily Moshi started PH master at SwissTPH, Amina Nyuri and Leila Samson complete PH master at the Nelson Mandela African Institution of Science and Technology (NM-AIST)
- **Clinical Specialization:** Dr. Getrude Mollel 3rd year of specialization in Pediatrics at the Muhimbili University Hospital, Dr. Elizabeth Senkoro has successfully completed 2 years of the Mark Wainberg Fellowship (IAS) within the "Experts in HIV service delivery" program (Kampala, London)

Research/Meetings

- Dr. Petro Sabuni attended the EACS summer school, Lisbon, Portugal
- The CDCI team had many presentations on the Ifakara Annual Scientific Conference 2023 (IASC2023)
- Dr. Robert Ndege presented a study on viral outcome under Dolutegravir on the 30th International Workshop on HIV Drug Resistance and Treatment Strategies, South Africa
- TB-CAPT (FIND/EDCTP) Consortium meeting in Dar es Salaam 10/2024



II Patient Numbers

HIV Testing at SFRRH 2023

Table 1 and Figure 1 - 2 show HIV test results at the SFRRH from January to December 2023 in routine care. Table 1 shows overall numbers and percentages, Figure 2 shows monthly testing numbers according to sex and total positives per month and Figure 3 shows the total positive according to sex.

	Total	Male	Female
Tested	15,574	5,436	10,138
Positive	268	100	168
Percentage	1.72	1.84	1.66

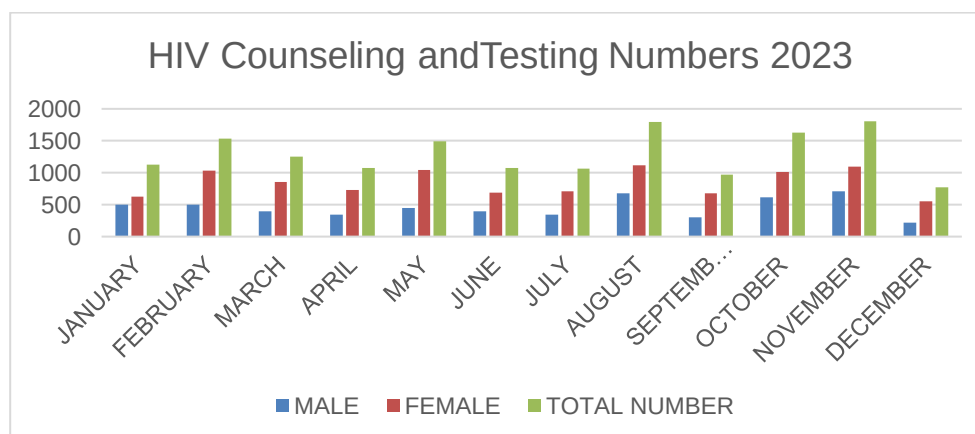


Figure 1 Testing numbers from voluntary counselling and testing (VCT) as well as provider (PITC) initiated testing and counselling services.

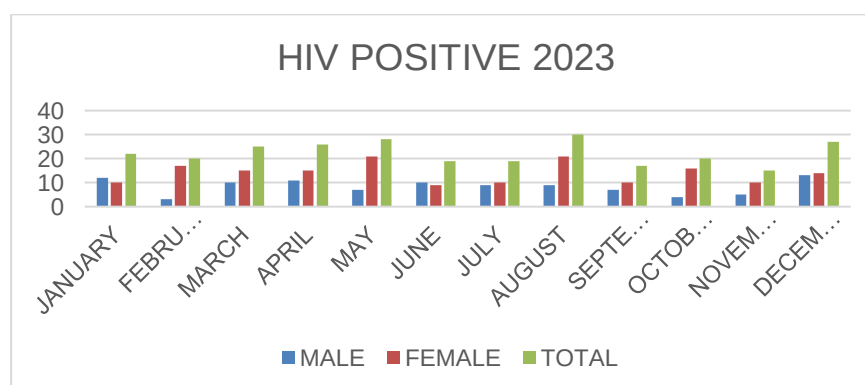


Figure 2 Total number of patients that tested HIV Positive according to sex

Patient enrolment at the CDCI

Numbers from the National AIDS Control Program (NACP) Database 1.1. - 31.12.2023

Table 2 shows overall patient numbers with a documented HIV infection seen at SFRH

	Adult (≥15-year-old)		Children (<15-year-old)		Total
	Female	Male	Female	Male	
Cumulative number of persons enrolled, n	714	3913	465	471	
Total, n	11,059		936		11,995
Cumulative number of persons on ART, n	6190	3217	451	489	
Total, n	9,407		940		10,347

Numbers from KIULARCO (openMRS) until December 31st, 2023

Figure 4 shows the number of patients enrolled yearly into KIULARCO 2023

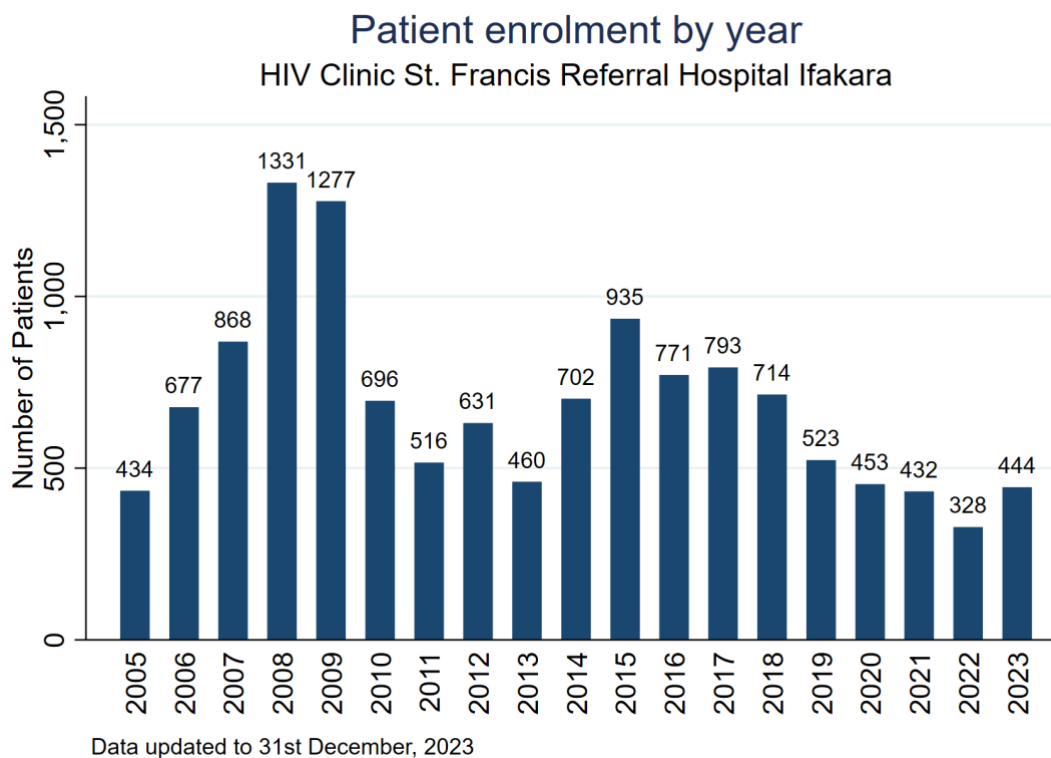


Table 3 Details of patients enrolled according to the KIULARCO (OpenMRS) database (until 31.12.2023)
See appendix for better readability

KIULARCO monthly report for January- December, 2023 for database updated upto 12/31/2023																			
Characteristics	Cumulative 2005-2023	January, 2023			February, 2023			March, 2023			April, 2023			May, 2023			June, 2023		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients*	444	46	24	22	32	23	9	34	21	13	26	16	10	35	25	10	30	17	13
Total enrolled patients	12'985																		
On active follow-up	3'805	44	23	21	32	23	9	33	21	12	26	15	11	35	25	10	29	16	13
Died	1'547	2	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Lost to follow-up	5'150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	2'483	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0
Age at enrolment																			
0 - 9	924	0	0	0	2	1	1	1	1	0	0	0	0	2	1	1	1	0	1
10 - 19	477	0	0	0	1	0	1	4	1	3	0	0	0	3	2	1	1	1	0
20 - 49	9'621	33	17	16	24	18	6	25	17	8	15	10	5	23	17	6	20	11	9
50 and Above	1'933	13	7	6	5	4	1	4	2	2	11	6	5	7	5	2	8	5	3
Pregnancy status at enrolment																			
No	7'606	22	22	0	19	19	0	21	21	0	15	15	0	21	21	0	17	17	0
Yes	577	2	2	0	4	4	0	0	0	0	1	1	0	4	4	0	0	0	0
ART information																			
Started ART	8'381	21	8	13	20	17	3	12	9	3	16	9	7	14	10	4	13	8	5
Started ART in other clinics	1'791	21	14	7	8	3	5	10	6	4	6	4	2	6	4	2	9	6	3
Never started ART	2'813	4	2	2	4	3	1	12	6	6	4	3	1	15	11	4	8	3	5
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	291'334	1'337	936	401	1'263	892	371	1'390	957	433	1'081	757	324	1'316	936	380	1'120	784	336
Patients on ART and on active follow-up**	3'707	4'470	3'018	1'452	4'444	3'006	1'438	4'414	2'989	1'425	4'477	2'961	1'416	4'349	2'943	1'406	4'314	2'919	1'395
*New enrolment of a specific year (its from January -December 31, 2023). **Number of visit includes visits for transit patients too, transit patients are patients who are registered in other HIV clinics but they can come to our HIV clinic either for ART drug refill or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.																			
Characteristics	Cumulative 2005-2023	July, 2023			August, 2023			September, 2023			October, 2023			November, 2023			December, 2023		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients*	444	31	18	13	43	27	16	40	18	22	41	29	12	35	27	8	51	26	25
Total enrolled patients	12'985																		
On active follow-up	3'805	31	18	13	41	25	16	40	18	22	40	28	12	32	24	8	51	26	25
Died	1'547	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
Lost to follow-up	5'150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	2'483	0	0	0	1	1	0	0	0	0	1	1	0	2	2	0	0	0	0
Age at enrolment																			
0 - 9	924	0	0	0	2	1	1	0	0	0	2	2	0	0	0	0	1	0	1
10 - 19	477	1	1	0	7	5	2	4	2	2	1	0	1	3	3	0	1	1	0
20 - 49	9'621	20	15	5	26	15	11	27	13	14	31	22	9	21	16	5	38	17	21
50 and Above	1'933	10	2	8	8	6	2	9	3	6	7	5	2	11	8	3	11	8	3
Pregnancy status at enrolment																			
No	7'606	15	15	0	23	23	0	17	17	0	25	25	0	21	21	0	21	21	0
Yes	577	3	3	0	4	4	0	1	1	0	4	4	0	6	6	0	5	5	0
ART information																			
Started ART	8'381	17	9	8	20	16	4	13	5	8	17	13	4	15	11	4	27	16	11
Started ART in other clinics	1'791	6	5	1	13	6	7	14	5	9	15	7	8	16	12	4	17	6	1
Never started ART	2'813	8	4	4	10	5	5	13	8	5	9	9	0	4	4	0	7	4	3
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	291'334	1'129	775	354	1'318	928	390	1'089	732	357	1'127	789	338	1'220	858	362	774	507	237
Patients on ART and on active follow-up**	3'707	4'285	2'899	1'386	4'023	2'747	1'276	3'982	2'719	1'263	3'940	2'691	1'249	3'885	2'653	1'232	3'691	2'532	1'159
*New enrolment of a specific year (its from January -December 7th, 2023). **Number of visit includes visits for transit patients too, transit patients are patients who are registered in other HIV clinics but they can come to our HIV clinic either for ART drug refill or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.																			



III Staff of the CDCI

Fifty-five local staff members are employed at the CDCI by five different organizations, namely: IHI/Swiss TPH (30), IHI/USB (2), SFRRH (6), USAID AFYA YANU/BENJAMIN MKAPA FOUNDATION (15), and 4 staff members through research projects. The CDCI team is currently composed of 5 medical doctors, 3 clinical officers, 7 nurses, 5 counselors, 3 auxiliary nurses, 1 nutritionist, 2 pharmacists, 2 statisticians, 7 data clerks, 4 biologists, 1 lab technician, and 6 auxiliary staff. This year we had changes in the research team due to more training opportunities, while the rest of the team has been quite stable over the last years, allowing to enhance established and sustainable structures.

The head of the clinic since 01.07.2022 is Dr. Ezekiel Luoga, deputy head is Dr. Bernard Kivuma. Dr. Lilian Moshi heads the One Stop Clinic since august 2022. Dr. Petro Sabuni is the clinical coordinator. Prof. Dr. Maja Weisser (Infectious Disease specialist from the University Hospital Basel, Switzerland, headed CDCI 2016-17) continues to support the CDCI as the clinical research coordinator.



Staff Changes January to December 2023

Departures	New Staff
<ul style="list-style-type: none"> - Sambuta (CO, due to his family issues) - Namvua Kimera (lab scientist, started her PhD) 	<ul style="list-style-type: none"> - Edgar Ngapemba (CO) - Lilian Moshi (MD, started her Master)

IV Infrastructure

The CDCI is located in the rear area of the outpatient department (OPD) with a separate area for tuberculosis outpatients and the One Stop Clinic located in the Reproductive and Child Health Clinic (RCH) of SFRRH. Also, close by is the Heart and Lung Clinic, another collaborative project of SwissTPH, IHI and SFRRH together with Charite University and the University Hospital Basel. Other services are integrated into the other departments of the hospital, e.g., testing activities and inpatient care.



The CDCI has reception room, a triage room, 3 testing and counseling rooms (2 adult and 1 OSC), 9 clinician's offices (6 Adult clinic and 3 OSC), a blood withdrawal room, 3 drug dispensing rooms (1 CDCI, 1 OSC, 1 TB), a trial/infusion room, a data and server room, a meeting hall, toilets for patients and staff. The One Stop Clinic, an integrated service clinic for HIV-affected families is located within the Reproductive and Child Health Clinic (RCH) of SFRRH. The pharmacy has an additional storage room within the general pharmacy of the SFRRH to fulfill storage requirements and to link to the electronic drug management system (eLMIS) of the hospital for accountability and ordering of antiretroviral drugs from the governmental Medical Stores Department (MSD). The laboratory activities are located within the Ifakara Health Institute laboratory (ISO 9001: 2015 certified), in close proximity to the hospital. Despite the CDCI has been generously built, and rooms a spacious, the number of rooms is limited to accommodate the increasing number of projects and activities.

IV Organization of the Clinic

Clinical Activities

HIV testing & counselling services

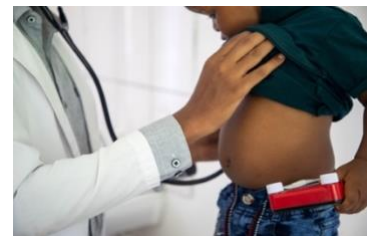
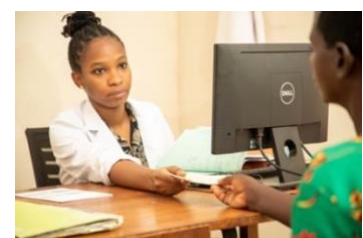
Three trained counselors (2 for adult patients, 1 for paediatric patients and families) are in charge of voluntary counselling and testing (VCT), provider-initiated testing and counselling (PITC) and index testing according to national guidelines. They are supported by volunteers and/or intern students who attend the clinic for 3-6 months at a time. An optimized Provider Initiated Testing and Counselling (PITC) service, consisting of a pre-selecting questionnaire has been implemented 2019. Testing numbers are registered and reported weekly to hospital staff and district authorities. Increasingly, counselling is important to address adherence issues in virally unsuppressed patients, patients who drop out of care and come back and to support patients with mental health problems.

Medical care – routine procedures

Upon confirmation of a new HIV infection patients are counselled by a professional and an HIV-positive lay counsellor on how to cope with the new condition. An educational video containing basic medical knowledge on HIV and reports of HIV-positive patients from Ifakara on their experience living with HIV is shown to patients with the aim to reduce stigmatization from the very beginning. Patients then receive a blood withdrawal with baseline investigations to understand the status of the immune system, co-infections and organ damage (see section on laboratory investigations).

Patient data is collected through standardized electronic questionnaire (Open Medical Record System, www.openmrs.org) for clinical purposes and as database of consenting participants in KIULARCO. In addition, data is captured for the NACP database on paper forms and transferred to the digital system by two data clerks.

After enrolment into care, patients are initially followed up monthly or more frequently if needed. In about half of patients advanced HIV (CD4 count <200cells/mm³ and/or WHO stage III/IV) is diagnosed, many of them diagnosed during hospitalization. After medical stabilization and viral suppression, patients might be seen 6monthly and upon request, care can be transferred to a care and treatment center closer to the patients' home. Monitoring of treatment response in stable patients is done yearly



by viral load as well as safety laboratory. CD4 are done yearly in those with CD4 <350/uL. In case of unsuppressed viral load, patients receive 3 enhanced adherence counselling and – if persistently unsuppressed – are switched from 1st to 2nd line ART. Resistance testing is done for patients with confirmed virological failure on 2nd line ART through the NACP. A breakdown has put the Sanger Sequencing Device out of service since 2020.

With the start of the NGS platform, resistance testing can be done at the IHI laboratory in Bagamoyo.



Pharmacy

The governmental Medical Stores Department through the support of International Partners provides all antiretroviral drugs and some additional medication for opportunistic infections such as e.g., liposomal amphotericin B. They are ordered through an electronic system according to patient consumption (eLMIS) and dispensed by two pharmacists and a nurse. Current first-line treatment for adults is the dolutegravir-based regimen combined with lamivudine/tenofovir disoproxil in a single pill and for children dolutegravir combined with lamivudine/abacavir for those with weight less than 30kg. Shortages of drugs are very rare.

Reducing attrition and improving Retention in care

Stigma remains a big challenge and a frequent cause of loss to follow-up besides structural challenges such as transport fees and long hours at the clinic. Professional and lay counselling and a locally produced video for newly diagnosed patients are offered to patients to reduce stigma and cope with the HIV-infection. In addition, patients are called within 1 week of a missed visit to invite them to come back to the clinic. If patients cannot be reached, a network of 12 volunteers funded by USAID Boresha Afya tracks patients at their home. Since implementation of routine viral load testing, virally unsuppressed patients (viral load >1000c/ml) are tracked for enhanced adherence counselling sessions, retesting and if needed, switch to second-line treatment. CDCI has also implemented different service delivery models aimed at decongestion of the clinic, reduce the amount of time spent by the patient at the clinic as well as the clinician's daily workload.

CDCI activities within SFRRH Wards

Hospitalized patients with a HIV and/or TB infection are seen by a designated doctor from the CDCI, doing daily ward rounds. Once a week a grand round is conducted under the supervision of the Head of CDCI or another senior physician. Most common reasons for hospitalization are co-infection with tuberculosis, or other opportunistic infections, e.g., toxoplasmosis, pneumocystis jirovecii pneumonia, cryptococcal meningitis. In addition, renal impairment, anemia and malignancies are frequent conditions. Services are delivered in collaboration with the medical staff of the SFRRH.

Integration of HIV and Tuberculosis Activities

According to the National Tuberculosis and Leprosy Program (NTLP) patients are screened for tuberculosis at routine clinical encounters, and further investigated upon clinical suspicion by chest x-ray and real-time PCR (Xpert

MTB/RIF Ultra). In addition, ultrasound is used for the assessment of extrapulmonary tuberculosis (EPTB) using the eFASH protocol (extended focused assessment with Sonography for HIV-associated tuberculosis). Currently, hospitalized HIV-positive patients are included in the multi-site TB CAPT EXULTANT trial, aiming to improve diagnosis of tuberculosis in this patient population by integrating novel diagnostic tests into the routine workup. For patients suspected to have post-TB sequelae we also work in close collaboration with the Heart and Lung Clinic to manage patients with Post-Tuberculosis Disease lung complications - e.g., chronic aspergillosis and those with other chronic heart and/or lung diseases.

Integration of the CDCI with the antenatal and under-five clinic of SFRRH

The 'One Stop Clinic' implemented in 2013 is the care and treatment center for families affected by HIV and is integrated into the Reproductive and Child Health Clinic (RCH) of SFRRH. HIV-infected pregnant women, HIV-exposed and HIV-positive children and their families can access all needed services under one roof. The team consists of 1-2 medical doctors, a clinical officer, a counsellor, a nurse, a pharmacist and a receptionist. Besides clinical care the One Stop Clinic functions as a referral clinic for early infant diagnosis and HIV care at the Kilombero district. The One Stop Clinic offers teen clubs for adolescents on Saturdays in collaboration with UNAIDS Afya yangu.



Integration of Malnutrition Services

In 2016 the CDCI has started an implementation project for care of undernourished HIV-positive and negative children. Since then, nutritional education for caregivers, family members and healthcare workers are offered within routine care together with nutritional support for infants within the services of the St. Francis Regional Referral Hospital. The nutritionist works in close collaboration with the hospital nursing staff and clinicians.



Cervical Cancer Screening

Cervical cancer is the leading cause of morbidity and mortality in Tanzania women (NACP 2019), and women living with HIV are at higher risk. Following NACP recommendations, Cervical Cancer Screening is integrated in the routine care and offered once yearly to all females with HIV. The Cervical cancer prevention (CECAP) service at SFRRH is run by the CDCI (2 nurses) in collaboration with the gynecology department (1 assistant medical officer) and is located in the Reproductive and Child Health Clinic (RCH). For 2 years, MCT-accredited CCS trainings including colposcopy are performed in collaboration with gynecologists from the University Hospital Basel and for participants from all over Tanzania. Furthermore, clinical research on improvement of diagnostics using PCR-based tests is ongoing. Regular community-based screening events have been organized and have attracted a high number of participants.

Community Activities



Afya yangu, Nacofa, Kizazi hodari within a community event at Msolwa, Ifakara council with the objective of increasing awareness of HIV disease, the availability, quality and sustainability of services for HIV treatment, testing, and prevention, reform laws, policies and practices to tackle stigma and exclusion faced by people living with HIV. Also, the aim was to help the community to adopt the “Let the communities lead” message to reduce and eliminate inequalities PLHIV face.

Regular outreach activities in collaboration with Afya Yangu or the Heart and Lung Clinic are performed offering HIV testing, counselling and training for peripheral health centers.

For the World AIDS day, we organized activities together with the Ministry of Health, the National AIDS Control programme, USAID

Laboratory activities

Monitoring of HIV-Therapy and Screening and Diagnosis of Opportunistic Infections

Laboratory screening and monitoring is done as per National AIDS Control guidelines. At baseline it consists of full blood and CD4 counts, creatinine, transaminases, screening for syphilis (VDRL), chest X ray, chronic Hepatitis B (HBsAg) and cryptococcal antigen test in patients with a CD4 cell count of <150/ul. In patients with symptoms of tuberculosis, an Xpert TB/RIF Ultra in sputum and an eFASH sonography is performed. Stool is analyzed for parasites if clinically indicated. Follow-up examinations in stable patients are done once yearly (safety lab and HIV Viral Load and in those with CD4<350/ul yearly CD4 cell counts). The provision of reagents for regular CD4 testing was very poor this year with frequent stockouts.



Hub for Viral load Testing

IHI laboratory continues to be the hub for viral load testing for Kilombero, Malinyi and Ulanga Districts. Results are electronically transmitted to NACP. Moving from a central lab to the district has reduced the turnaround time for results from 59 days to 20 days. Besides the direct impact on health of patients (timely switch to an effective treatment in case of failure), the risk of transmission is reduced. Additionally, HIV resistance testing is done in patients with persistently positive viral load or clinical failure.



Early Infant Diagnosis

DNA PCR assays for early infant diagnosis have been routinely implemented at IHI lab with a 2 weeks turnaround time. We are working towards becoming a hub for EID same as for viral load to improve services for patients living in remote parts of the area.

Quality management system

The Quality Management System according to ISO 15189:2012 for clinical laboratory testing, and specifically full blood count, creatinine, ALAT, CD4, HIV Viral load and Xpert MTB/Rif put in place 2021, has this year been reviewed and approved by SADICAS and IHI.

V Research activities

Research Areas

KIULARCO cohort is the basis for nested projects aimed to tackle and answer questions regarding treatment outcome, retention in care, co-infections and other comorbidities. Ethical approval is obtained yearly from the IHI Institutional Review Board and the National Institute of Medical Research. The aim of research is to improve patient services by improved knowledge, inform national authorities and impact guidelines. Moreover, KIULARCO provides a unique opportunity for capacity building and career development of junior researchers. Topics are:

Treatment outcome in people living with HIV/AIDS	<ul style="list-style-type: none"> • Virologic outcome and resistance development • Adherence/Loss to Follow up
Comorbidities	<ul style="list-style-type: none"> • Non-communicable diseases such as arterial hypertension, cervical cancer • TB-HIV co-infection/sonography in TB
Maternal and Child health in HIV	<ul style="list-style-type: none"> • Mother-to-child transmission • HIV infection in children and adolescents

Data management and Statistical Analyses

The Clinical Statistics and data Management Group from Swiss TPH (PD Dr. Tracy Glass, Fiona Vanobberghen, James Okuma) support the local data team (Lulu Wilson, Elizabeth Dotto) in the data management and mostly statistical supervision of research projects. James Okuma regularly visits Ifakara to support research projects and database management on site. Jerome Lwali from IdEaE Network in Morogoro supports the clinic in ICT aspects and amending the medical record system (openMRS).



Running Trials

In 2023, 2 multi-site trials running:

- **Genotype-Informed Versus Empiric Management Of VirEmia (Give Move):** In this BOTNAR-funded randomized controlled trial led by the University of Basel (PI Jennifer Brown), we assessed the role of resistance testing in pediatric HIV patients with a first high Viral load compared to standard of care treatment. The country PI for Tanzania is Dr. Ezekiel Luoga. The trial has successfully been completed mid 2023 and is submitted for publication.
- **Sauti ya Vijana (SYV):** The NIH-sponsored mental health intervention to improve HIV outcomes in Tanzanian youths is a collaborative project with KCMC Moshi, Baylor Mbeya and Baylor Mwanza Tanzania. It investigates, whether peer counselling improves treatment outcomes among adolescents living with HIV. PI for Ifakara is Dr. Getrude Mollel. The study has been launched in October 2022 and is starting the 3rd intervention within the 5years timeline.
- **TB CAPT EXULTANT:** Within this multisite study in Tanzania, performed in Mbeya, Ifakara, Dar es Salaam and 2 sites in Mozambique, the CDCI participates in the EXULTANT study aiming to improve TB diagnosis in hospitalized patients with HIV. Under the lead of FIND and IS Global, sponsored by the EDCTP, the trial has started in November 2022 and is about to finalize recruitment.

These trials aim at improvement of care in rural sites, but also offer training options and career building.

Publications 2023

See list in the appendix

Conferences

Ifakara Annual Scientific Conference (IASC2023) 08/2023, Homeland Hall, Ifakara, Morogoro, TZ

- o Dr. Lilian Moshi presented on 'advanced HIV in children and adolescents'
- o Dr. Bernard Kivuma presented the Sauti ya vijana Project
- o Jamali Siru presented preliminary results of the CoArTHA trial on antihypertensive treatment regimen.
- o Lulu Wilson presented results of the study on integration of Lung Ultrasound into clinical care of patients with chest symptoms
- o Dorcas Mnzava presented results from the HPV Screening Study on Cervical Cancer Screening



30th International Workshop on HIV Drug Resistance and Treatment Strategies, Cape Town, South Africa 20-22nd September 2023:

- Dr. Robert Ndege presented the Project on viral suppression on Dolutegravir

Second RMNCAH+N Scientific conference “Advancing access to quality Reproductive, Maternal, Newborn, Child, Adolescent Health and Nutrition (RMNCAH+N) services through evidence-based practices” Julius Nyerere International Convention Centre (JNICC), Dar es Salaam 15-17 november 2023

- D. Mnzava presented her study: ‘HPV prevalence and genotype distribution among women living in rural Tanzania: prospective study from the Kilombero and Ulanga (oral presentation, D. Mnzava)

TB-CAPT (FIND/EDCTP) Consortium meeting in Dar es Salaam 10/2024

- Dr. Robert Ndege, Prof. Maja Weisser, Dr. Bernard Kivuma, Mohammed Mbaruku, Dorcass Mnzava, Salehe Masoud presented the Project on viral suppression on Dolutegravir

VI Training activities

Daily early morning meetings take place covering clinical case presentations, state of the art lectures on HIV and associated diseases, interdisciplinary discussion on patients with HIV sequencing results, quality meetings, research discussions and journal club. Sessions are coordinated by a team member on a rotational basis, contributing to a continuous medical education and fostering clinical discussion among the team.

- Dr. Ezekiel Luoga has successfully completed his online Master program in Public Health from the University of Suffolk.
- Dr. Elizabeth Senkoro completed her Fellowship in HIV/AIDS Care with the International AIDS Society in London
- Alex Ntamatingiro has finalized his PhD program under CARTA.
- Miss Aneth Vedastus, statistician continued her PhD program under CARTA.
- Dr. Herieth Wilson has completed a Master in Public Health at the University of Dublin, Dublin, Ireland
- Mrs Olivia Kitau has completed a Master in Public Health at Limerick University, Ireland
- Dr Getrude J Mollel is in the 3^o year of pediatric specialization at the Muhimbili University of Health and Allied Sciences.
- Leila Samson (counsellor) and Amina Nyuri (lab scientist) are finalizing their Master in Public Health under IHI together with the Nelson Mandela African Institution of Science and Technology (NM-AIST) in Bagamoyo.
- Dr. Robert Ndege is in the 2nd year of his PhD program in epidemiology at the University of Basel, Switzerland
- Miss Farida Bani is continuing her online Bachelor of science in food, nutrition, and diet training at the Open University of Tanzania.
- Dr. Lilian Moshi has started a master in public health at SwissTPH in Basel

Visitors/Collaborators from abroad

Civil servants: Mr Florent Hérítier, Mr Bedran Topyürek, Mr. Fredy Geiger, Mr. Florian Müry graduated from the Medical Faculty at the University of Basel, Switzerland and did a rotation at the CDCI.

Mrs Sara Glanzmann, an MD from Switzerland has spent several months in Ifakara for a project on health outcomes of HIV-exposed infants

VII Collaborations/Important Visits

January 16 th – 20 th 2023	Point of Care Sonography training with PD Dr. J. Tuma, Heart and Lung Team
January 30 th – February 3 rd 2023	Dr. Marcus Aschwanden and Dr Andrej Isaak visited Ifakara for the training in vascular sonography
May 18 th – 25 th 2023	Colposcopy Training Dr. André Kind, Dr. Sina Kern (USB), Dr B. Frey (Kantonsspital BL), PD Dr. Andreas Kaufman
June 10 th – 14 th 2023	Point of Care Sonography training with PD Dr. J. Tuma, Heart and Lung Team
	A delegation from Swiss TPH and IHI visited the collaborative projects in Ifakara, Bagamoyo and Dar es Salaam: Prof. Juerg Utzinger, director Swiss TPH, Prof. Christian Lengeler, country responsible Swiss TPH, Mrs Eva Herzog, Nationalrätin and Board of SwissTPH, Mr Beat Jans, maire of Baselstadt, Luz Hegemann, Head of Novartis Foundation, Mrs Tracy Glass, head statistician SwissTPH
September 18 th – 28 th 2023	James Okuma and Fiona Vanobberghen from SwissTPH visited for collaboration with the data team
October 16 th -20 th 2022	Prof. Beat Kaufmann and Dr. Thilo Burkard (cardiology University Hospital Basel) visited for a training course in echocardiography (Heart & Lung Clinic). (Charité Berlin) visited for colposcopy & CCS training
November 2022	Prof. Thomas Zoller, Charité Berlin, visited Heart & Lung Clinic

VII Funding Situation/Budget

The CDCI and KIULARCO are funded through different institutions and organizations. While the funding for drug and basic clinical services comes through the National AIDS Control Program and International HIV Grants (e.g., PEPFAR and Global Fund) implemented by local partners (USAID Afya Yangu), the additional activities for quality care, training and improving health through research are funded through different institutions, mainly the Swiss Tropical and Public Health Institute, the University Hospital Basel and the Ifakara Health Institute. International HIV projects are cutting down funds, putting pressure on national health programs. From the projects, new funding partners are urgently needed and several applications have been made in order to ensure continuation of activities. On top of routine care we submit to several competitive grant opportunities for research projects, which also support the platform.

VIII Conclusions

In 2023, the Chronic Diseases Clinic has continued to contribute to high quality services for HIV within the National AIDS control program. It is a role model for integrated patient care, research and training with a National reputation. Most importantly, as a clinic we attain high viral suppression rates for those in care. Increasingly, non-communicable disease management is integrated and training becomes an even more central aspect with MCT-accredited training activities on site and many collaborators moving ahead to formal trainings. A strong collaboration with national stakeholders is maintained to ensure implementation of lessons learnt from the cohort. The CDCI model character for services in rural areas is well perceived supports to push the health agenda in Tanzania.



ANNEX I. LIST OF PUBLICATIONS of the CDCI (last 3 years)

1. Herry Mapesi, Ravi Gupta, Herieth Ismael Wilson, Blaise Lukau, Alain Amstutz, Aza Lyimo, Josephine Muhairwe, Elizabeth Senkoro, Theonestina Byakuzana, Madavida Mphunyane, Moniek Bresser, Tracy Renée Glass, Mark Lambiris, Günther Fink, Winfrid Gingo, Manuel Battegay, Daniel Henry Paris, Martin Rohacek, Fiona Vanobberghen, Niklaus Daniel Labhardt, Thilo Burkard, Maja Weisser. The coArTHA trial—identifying the most effective treatment strategies to control arterial hypertension in sub-Saharan Africa: study protocol for a randomized controlled Trial. *Trials* (2021) 22:77. <https://doi.org/10.1186/s13063-021-05023-z>
2. Vanobberghen F, Weisser M, Kasuga B, Katende A, Battegay M, Tanner M, Glass On Behalf Of The Kiularco Study Group. Mortality Rate in a Cohort of People Living With HIV in Rural Tanzania After Accounting for Unseen Deaths Among Those Lost to Follow-up. *Am J Epidemiol.* 2021 Feb
3. R, Senkoro E, Vanobberghen F, M. "Linkage to care" among people living with HIV - definition in the era of "universal test and treat" in a sub-Sahara African setting. *Swiss Med Wkly.* 2021 Jul 7;151:w20535. doi: 10.4414/smw.2021.20535. eCollection 2021 Jul 5.
4. Andrea Kuemmerle, George Sikalengo, Fiona Vanobberghen, Robert C Ndege, Gideon Foe, Chloé Schlaeppli, Christian Burri, Manuel Battegay, Daniel H Paris, Tracy R Glass, Maja Weisser, Catia Marzolini, the KIULARCO Study Group, Recognition and management of clinically significant drug–drug interactions between antiretrovirals and co-medications in a cohort of people living with HIV in rural Tanzania: a prospective questionnaire-based study, *Journal of Antimicrobial Chemotherapy*, 2021;, dkab254, <https://doi-org.eres.qnl.qa/10.1093/jac/dkab254>
5. Herry Mapesi, James Okuma, Fabian Franzeck, Herieth Ismael Wilson, Elizabeth Senkoro, Theonestina Byakuzana, Robert Ndege, Fiona Vanobberghen, Tracy Renée Glass, Manuel Battegay, Maja Weisser and Daniel Henry Paris on behalf of the KIULARCO Study Group. Prevalence, incidence and predictors of renal impairment in persons with HIV receiving protease-inhibitors in rural Tanzania. *PLOS One* 2021-12-15, DOI: 10.1371/journal.pone.0261367
6. Robert C Ndege, James Okuma, Aneth V Kalinjuma, Julius Mkumbo, Elizabeth Senkoro, Gideon Foe, Leila Samson, Herry Mapesi, Siraji Shabani, Tracy R Glass, Manuel Battegay, Daniel Paris, Fiona Vanobberghen and Maja Weisser on behalf of the KIULARCO Study Group. Failure to return Pillbox is a Predictor of Lost to Follow-Up among People Living with HIV on Antiretroviral Therapy in rural Tanzania. *HIV Medicine* 2021; 00:1-12
7. Getrud Joseph Mollel, Lilian Mushi, Hoda Hazem, Anna Eichenberger, Olivia Kitau, Herry Mapesi, Tracy R. Glass, Daniel Henry Paris, Maja Weisser, Fiona Vanobberghen, on behalf of the KIULARCO Study Group. Causes of death and associated factors over a decade of follow-up in a cohort of people living with HIV in rural Tanzania. *BMC Infectious Diseases* 2022) 22:37
8. Magnolini R, Senkoro E, Kalinjuma AV, Kitau O, Kivuma B, Samson L, Eichenberger A, Mollel GJ, Krinke E, Okuma J, Ndege R, Glass T, Mapesi H, Vanobberghen F, Battegay M, Weisser M. Stigma-directed services (Stig2Health) to improve 'linkage to care' for people living with HIV in rural Tanzania: study protocol for a nested pre-post implementation study within the Kilombero and Ulanga Antiretroviral Cohort. *AAS Open Research.* Accepted 09/2022.
9. Ndege R, Ngome O, Vanobberghen F, Bani F, Temba Y, Wilson H, Hella J, Gingo W, Sasamalo M, Mnzava D, Kimera N, Hiza H, Wigayi J, Mapesi H, Kato IB, Mhimbira F, Reither K, Battegay M, Paris DH, Weisser M, Rohacek M. Ultrasound in managing extrapulmonary tuberculosis: A randomised, controlled, parallel, superiority, open-label trial. *Clin Infect Dis.* 2022 Nov 4;ciac871. doi: 10.1093/cid/ciac871. Online ahead of print.
10. Max Bauer, Faraja Kitila, Ipyana Mwasongwe, Issa S. Abdallah, Evelyn Siongo, Sylvester Kasunga, Winfrid Gingo, Robert Ndege, Karin Hasler, Daniel H. Paris, Maja Weisser, Martin Rohacek. Ultrasonographic findings in patients with abdominal symptoms or trauma presenting to an emergency room in rural Tanzania. *PLoS ONE* 17(6): e0269344. <https://doi.org/10.1371/journal.pone.0269344>
11. Maja Weisser, Martin Rohacek, Robert Ndege, Ezekiel Luoga, Andrew Katende, Getrud J. Mollel, Winfrid Gingo, Fiona Vanobberghen, Manuel Battegay on behalf of the KIULARCO study group. The Chronic Diseases Clinic of Ifakara (CDCI) – a model clinic for chronic care delivery in rural sub-Saharan Africa. *Diseases* 2022;10, 72
12. Linda Stöger, Andrew Katende, Herry Mapesi, Aneth V Kalinjuma, Liselot van Essen, Thomas Klimkait, Manuel Battegay, Maja Weisser, and Emilio Letang Persistent High Burden and Mortality Associated With Advanced HIV Disease in Rural Tanzania Despite Uptake of World Health Organization "Test and Treat" Guidelines. *Open Forum Infect Dis.* 2022 Dec; 9(12): ofac611.
13. Mnzava D, Okuma J, Ndege R, Kimera N, Ntamungiro A, Nyuri A, Byakuzana T, Abilahi F, Mayeka P, Temba E, Fanuel T, Glass TR, Klimkait T, Vanobberghen F, Weisser M; KIULARCO Study Group. Decentralization of viral load testing to improve HIV care and treatment cascade in rural Tanzania: observational study from the Kilombero and Ulanga Antiretroviral Cohort. *BMC Infect Dis.* 2023 Apr 7;23(1):222. doi: 10.1186/s12879-023-08155-6.
14. Alex J Ntamungiro, Anna Eichenberger, James Okuma, Fiona Vanobberghen, Robert Ndege, Namvua Kimera, Joel M Francis, Juliana Kagura, Maja Weisser on behalf of the KIULARCO Study Group. Transitioning to dolutegravir in a programmatic setting: Virological outcomes and associated factors among treatment-naïve patients with HIV-1 in the Kilombero and Ulanga antiretroviral cohort in rural Tanzania. *Open Forum Infectious Diseases*, ofad321, <https://doi.org/10.1093/ofid/ofad321>
15. Aneth Vedastus Kalinjuma, Hannah Hussey, Getrud Joseph Mollel, Emilio Letang, Manuel Battegay, Tracy R. Glass, Daniel Paris, Fiona Vanobberghen, Maja Weisser, on behalf of the KIULARCO study group. Body mass index trends and its impact of under and

- overweight on outcome among PLHIV on antiretroviral treatment in rural Tanzania: A prospective cohort study. PLoS ONE 2023, 18(8): e0290445. <https://doi.org/10.1371/journal.pone.0290445>
16. Anton-Vazquez V, Mnzava D, Okuma J, Mlembe S, Lo Riso L, Sanchez JM, et al. (2023) Improving anaemia diagnosis using peripheral blood smear with remote interpretation in adults living with HIV with moderate to severe anaemia: A prospective study nested within the Kilombero and Ulanga antiretroviral cohort. PLoS ONE 18(10): e0293084. <https://doi.org/10.1371/journal.pone.0293084>
 17. Kalinjuma AV, Glass TR, Masanja H, Weisser M, Msengwa AS, Vanobberghen F, Otworld K. Statistical methods applied for the assessment of the HIV cascade and continuum of care: a systematic scoping review. *BMJ Open*. 2023 Nov 23;13(11):e071392. doi: 10.1136/bmjopen-2022-071392.
 18. Di Salvo I, Mnzava D, Nicoletti GJ, Senkoro E, Ndege RC, Huang DJ, Makunja NT, Kassiga GI, Kaufmann AM, Weisser M, Kind AB. Upscaling cervical cancer screening and treatment for women living with HIV at a rural referral hospital in Tanzania: protocol of a before-and-after study exploring HPV testing and novel diagnostics. *BMC Health Serv Res*. 2023 Mar 10;23(1):234. doi: 10.1186/s12913-023-09113-3.

KIULARCO monthly report for January- December, 2023 for database updated upto 12/31/2023														
Characteristics	Cumulative 2005-2023	January, 2023		February, 2023		March, 2023		April, 2023		May, 2023		June, 2023		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	
Newly enrolled patients¶	444	46	24	22	32	23	9	34	21	13	26	16	10	30
Total enrolled patients	12'985													
On active follow-up	3'805	44	23	21	32	23	9	33	21	12	26	15	11	29
Died	1'547	2	1	1	0	0	0	1	0	1	0	0	0	0
Lost to follow-up	5'150	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	2'483	0	0	0	0	0	0	0	0	0	1	1	0	0
Age at enrolment														
0 - 9	924	0	0	0	2	1	1	1	1	0	0	0	0	1
10 - 19	477	0	0	0	1	0	1	4	1	3	0	0	0	1
20 - 49	9'621	33	17	16	24	18	6	25	17	8	15	10	5	20
50 and Above	1'933	13	7	6	5	4	1	4	2	2	11	6	5	8
Pregnancy status at enrolment														
No	7'606	22	22	0	19	19	0	21	21	0	15	15	0	17
Yes	577	2	2	0	4	4	0	0	0	0	1	1	0	0
ART information														
Started ART	8'381	21	8	13	20	17	3	12	9	3	16	9	7	13
Started ART in other clinics	1'791	21	14	7	8	3	5	10	6	4	6	4	2	9
Never started ART	2'813	4	2	2	4	3	1	12	6	6	4	3	1	8
All enrolled patients														
Follow-up visits*														
Cumulative number of visits	291'334	1'337	936	401	1'263	892	371	1'390	957	433	1'081	757	324	1'120
Patients on ART and on active follow-up**	3'707	4'470	3'018	1'452	4'444	3'006	1'438	4'414	2'989	1'425	4'477	2'961	1'416	4'314
¶New enrolment of a specific year (its from January -December 31, 2023). **Number of visit includes visits for transit patients too, transit patients are patients who are registered in other HIV clinics but they can come to our HIV clinic either for ART drug refill or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.														
Characteristics	Cumulative 2005-2023	July, 2023		August, 2023		September, 2023		October, 2023		November, 2023		December, 2023		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	
Newly enrolled patients¶	444	31	18	13	43	27	16	40	18	22	41	29	12	8
Total enrolled patients	12'985													
On active follow-up	3'805	31	18	13	41	25	16	40	18	22	40	28	12	51
Died	1'547	0	0	0	1	1	0	0	0	0	0	0	0	0
Lost to follow-up	5'150	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	2'483	0	0	0	1	1	0	0	0	0	1	1	0	0
Age at enrolment														
0 - 9	924	0	0	0	2	1	1	0	0	0	2	2	0	0
10 - 19	477	1	1	0	7	5	2	4	2	2	1	0	1	0
20 - 49	9'621	20	15	5	26	15	11	27	13	14	31	22	9	38
50 and Above	1'933	10	2	8	8	6	2	9	3	6	7	5	2	11
Pregnancy status at enrolment														
No	7'606	15	15	0	23	23	0	17	17	0	25	25	0	21
Yes	577	3	3	0	4	4	0	1	1	0	4	4	0	5
ART information														
Started ART	8'381	17	9	8	20	16	4	13	5	8	17	13	4	27
Started ART in other clinics	1'791	6	5	1	13	6	7	14	5	9	15	7	8	17
Never started ART	2'813	8	4	4	10	5	5	13	8	5	9	9	0	7
All enrolled patients														
Follow-up visits*														
Cumulative number of visits	291'334	1'129	775	354	1'318	928	390	1'089	732	357	1'127	789	338	774
Patients on ART and on active follow-up**	3'707	4'285	2'899	1'386	4'023	2'747	1'276	3'982	2'719	1'263	3'940	2'691	1'249	3'691
¶New enrolment of a specific year (its from January -December 7th, 2023). **Number of visit includes visits for transit patients too, transit patients are patients who are registered in other HIV clinics but they can come to our HIV clinic either for ART drug refill or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.														