

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

Annual Report 2020

A collaboration between

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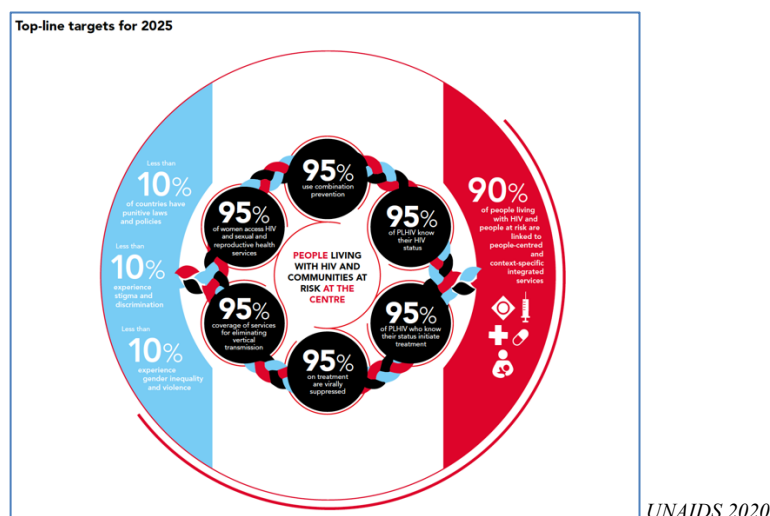
I. Summary

HIV/AIDS remains an important cause of death in many countries in sub-Saharan Africa despite tremendous achievements in the last 15 years. According to the UNAIDS report 2020, the HIV prevalence among adults aged 15-49 in Tanzania was 4.8% in 2019 and, the incidence among all ages was 1.46/1000 population. New infections have decreased from 83'000 in 2010 to 77'000 in 2019. The country has been able to achieve the second and third WHO 90-90-90 goals in 2020 but, achieving the first 90 remained a challenge: Currently 83% people know their HIV status (1st 90); 90% of people living with HIV (PLHIV) are in care (2nd 90) and 92% of PLHIV are virally suppressed (3rd 90).

Since 2005 the Chronic Diseases Clinic of Ifakara (CDCI) is continuously delivering services to patients as the Care and Treatment Center (CTC) of the St. Francis Referral Hospital (SFRH) in Ifakara, Morogoro. Established as joint project of the Swiss Tropical and Public Health Institute, the Ifakara Health Institute, the SFRH and the University Hospital Basel, the CDCI focuses on HIV testing, enrollment 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, collaborating closely with local implementing partners of national HIV programs, district and national governmental authorities. The viral suppression rate within the clinic is 92%, similar to the current national level. The IHI laboratory continues as a referral hub in viral load and early infant PCR testing for the 4 surrounding districts in the Kilombero valley.

Along with clinical services, CDCI runs a patient cohort the Kilombero and Ulanga Antiretroviral Cohort (KIULARCO) including consenting patients attending the CDCI. KIULARCO has become one of the biggest cohorts in rural sub-Saharan Africa with a follow-up of up to 15 years and contains demographic, clinical information and storage of blood samples. About 11,000 patients have been enrolled - 4'200 are under active care. The third pillar of CDCI is training and capacity building of young medical doctors, nurses, laboratory scientists and epidemiologists.

The COVID-19 pandemic has affected HIV care from march to June 2020. Fortunately, in Ifakara clinical services could be offered at any time under strict usage of protective equipment. With aid from our collaborators, no shortages in material, reagents or drugs were encountered during this period. However, patients during that time attended the hospital less frequently and numbers for HIV testing went down significantly. All research projects were paused for about 2 months.



Highlights and achievements of 2020 at CDCI

- Dr. Robert Ndege was appointed as the new head of the CDCI
- A member of the team was appointed into the National Aids Control Program Clinical Subcommittee
- We could participate in the Technical Working Groups for the formulation of the National Aids Control Program third line ART implementation guidelines for the country
- Two of our collaborators are National mentors on Paediatric Malnutrition
- Two RCTs (COARTHA study; GIVE MOVE study) could be started successfully
- A new collaboration with the Charité Berlin (TELEMATICS study and the Heart & Lung Clinic) was started
- We obtained an ESTHER Switzerland Grant for a malnutrition Project in the district
- Improvement of Cervical Cancer Screening through a Project with the University Hospital Basel
- Preparation to become part of the leDeA East African Network
- Training: Dr. Robert Ndege successfully achieved his Master title in Infectious Diseases from the London school of Hygiene and Tropical Medicine, Dr. Andrew Katende successfully completed a specialization in Internal Medicine at the Makerere University in Kampala, Uganda. Other trainings are ongoing.



CDCI during the COVID pandemics

With an increasing number of COVID cases seen in march 2020 in Tanzania, schools were closed for a period of three months April to June, hand hygiene was implemented all over the country and masks were implemented at all hospitals – for patients and healthcare workers. The SFRH and the CDCI were able to maintain services throughout this period. Also, the hospital could offer Personal Protective Equipment to all healthcare workers thanks to the collaborative projects.

During this period a remarkably lower number of patients attended the hospital and there was reduced community testing activities supported by the implementing partner resulting in lower numbers of HIV tests performed. This led to a lower number of patients recruited into KIULARCO kept fluctuating, highest in June (46) lowest in march (23) while we have the highest testing numbers all year in march. However, we neither experienced stock out of antiretroviral drugs nor reagents during the entire period. Clinical visits in stable patients were reduced to a minimum and patient contact was reduced to measurement of vital signs which was done in an open area with good ventilation, observing all preventive measures (both the medical personnel and the patient wore masks. We used an infrared thermometer and the nurse taking the measurements were equipped with a face shield. Reception services as well as drug dispensing was done behind physical barriers (the patient presented the card at the reception and only the card was submitted at the pharmacy while patients waited outside for their drugs). Recruitment for trials and non-essential interventions were paused. Meetings and sessions were done over zoom. In our clients we did not observe an increased number of respiratory tract infections. All research activities were resumed in June and other activities such as sessions and clinical meetings gradually reimplemented as previously.

II. Patient Numbers

HIV Testing at SFRH 2020

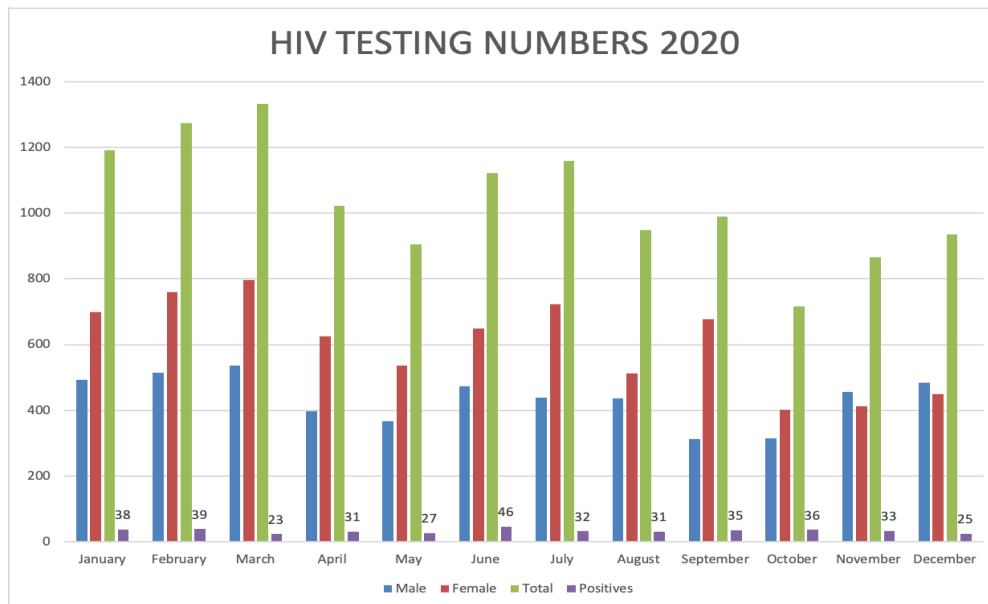
Figure 1 and 2 show HIV test results at the SFRH from January to December 2019 in routine care. Figure 1 shows overall numbers and percentages, Figure 2 shows monthly testing numbers according to sex and total positives per month.

Figure

	Total	Male	Female
Tested	12'466	5'224	7'242
Positive	396		
Percentage	3.17		

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Figure 2 Testing numbers from voluntary counseling and testing (VCT) as well as provider (PITC) initiated testing and counseling services.



Patient enrolment at the CDCI

Numbers from the National AIDS Control Database (NACD) 1.1.-31.12.2020

Table 1 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	6'700	3'635	531	531	
Total, n	10'335		1'062		11'397
Cumulative number of persons on ART, n	5'611	2'881	423	444	
Total, n	8'492		867		9'359

Numbers from KIULARCO (openMRS) until December 31st, 2020

Figure 3 shows the number of patients enrolled yearly into KIULARCO

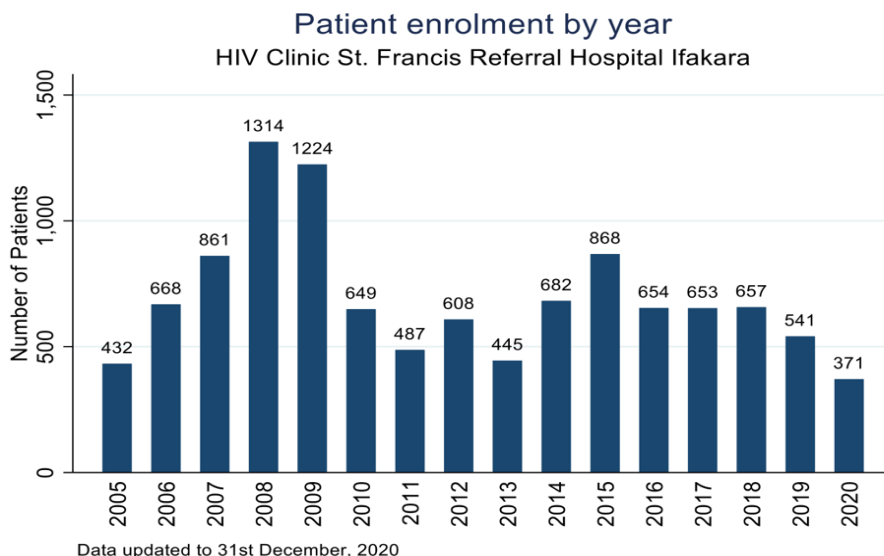


Table 2 Details of patients enrolled according the OpenMRS database (until 31st December 2020)

KIULARCO monthly report for January- December, 2020 for database updated upto 31/12/2020																			
Characteristics	Cumulative 2005-2019	January, 2020			February, 2020			March, 2020			April, 2020			May, 2020			June, 2020		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients#	371	45	28	17	49	32	17	34	27	7	22	12	10	24	18	6	41	29	12
Total enrolled patients	11,103																		
On active follow-up	4,188	44	28	16	40	25	15	34	27	7	22	12	10	24	18	6	40	28	12
Died	1,093	1	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Lost to follow-up	4,223	0	0	0	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	1,599	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0
Age at enrolment																			
0 - 15	1,039	4	3	1	3	1	2	0	0	0	1	0	1	1	1	0	4	3	1
16 - 49	8,500	34	22	12	41	27	14	30	24	6	17	11	6	23	17	6	32	26	6
50 and Above	1,564	7	3	4	5	4	1	4	3	1	4	1	3	0	0	0	5	0	5
Pregnancy status at enrolment																			
No	6,567	22	22	0	23	23	0	21	21	0	10	10	0	18	18	0	24	24	0
Yes	469	6	6	0	9	9	0	6	6	0	2	2	0	0	0	0	5	5	0
ART information																			
Started ART	7,635	30	17	13	22	14	8	14	10	4	10	4	6	10	8	2	27	19	8
Started ART in other clinics	1,526	4	4	0	3	2	1	7	7	0	2	2	0	2	2	0	5	4	1
Never started ART	1,942	9	6	3	24	16	8	13	10	3	10	6	4	12	8	4	9	6	3
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	234,386	1,749	1,248	501	1,595	1,118	477	1,607	1,110	497	1,483	1,064	419	1,155	793	362	1,518	1,029	489
Patients on ART and on active follow-up**	3,642	4,044	2,679	1,308	4,513	3,029	1,484	3,976	2,640	1,280	3,950	2,626	1,269	3,932	2,617	1,262	3,902	2,595	1,254

*New enrolment of a specific year (its from January -December 31, 2020). **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.

KIULARCO monthly report for July- December, 2020 for database updated upto 31/12/2020																			
Characteristics	Cumulative 2005-2019	July, 2020			August, 2020			September, 2020			October, 2020			November, 2020			December, 2020		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients#	524	34	22	12	26	11	15	28	18	10	23	17	6	21	14	7	24	18	6
Total enrolled patients	10,714																		
On active follow-up	4,098	27	17	16	26	11	15	25	16	9	21	16	5	21	14	7	22	17	5
Died	1,053	3	3	0	0	1	0	1	0	1	0	0	0	0	0	0	2	1	1
Lost to follow-up	4,050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	1,513	4	2	2	0	0	0	2	2	0	2	1	1	0	0	0	0	0	0
Age at enrolment																			
0 - 15	1,014	2	1	1	0	0	0	1	0	1	1	0	1	2	2	0	5	3	2
16 - 49	8,192	23	16	7	19	9	10	21	16	5	16	14	2	17	10	7	11	9	2
50 and Above	1,499	9	5	4	7	2	5	6	2	4	6	3	3	2	2	0	8	6	2
Pregnancy status at enrolment																			
No	6,344	19	19	0	6	6	0	16	16	0	15	15	0	13	13	0	16	16	0
Yes	424	3	3	0	5	5	0	2	2	0	2	2	0	1	1	0	2	2	0
ART information																			
Started ART	7,487	21	13	8	12	6	6	16	12	4	15	13	2	13	7	6	15	12	3
Started ART in other clinics	1,269	4	4	0	4	3	1	0	0	3	2	1	4	4	0	2	2	2	0
Never started ART	1,958	9	5	4	10	2	8	12	6	6	5	2	3	4	3	1	7	4	3
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	234,386	1,601	1,110	491	1,469	1,042	427	1,532	1,065	467	1,882	1,317	565	1,458	1,027	431	1,394	958	436
Patients on ART and on active follow-up**	4,006	3,849	2,568	1,231	3,820	2,553	1,219	3,786	2,531	1,208	3,740	2,508	1,186	3,690	2,473	1,172	3,642	2,443	1,156

*New enrolment of a specific year (its from January -December 31, 2020). **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.

Comment: we interpret the reduction in testing and new enrolments primarily as within the COVID pandemics when less patients attended the hospital. However further improvement of test & treat in remote sites and a reduction of testing to people at risk s within the government program could affect the numbers as well.

III. Staff of the CDCI

Forty-five local staff members are employed at the CDCI by five different organizations, namely: IHI/Swiss TPH (26), IHI/USB (2), SFRH (5), USAID-BORESHA AFYA (12), and one foreign staff member through Swiss TPH. Additionally, 6 persons work on granted research or affiliated implementation projects. The CDCI team is currently composed of 8 medical doctors, 2 clinical officers, 7 nurses, 3 counselors, 5 auxiliary nurses, 1 nutritionist, 2 pharmacists, 2 statisticians, 7 data clerks, 4 biologists, 1 lab technician, and 6 auxiliary staff. The team has been quite stable over the last years, allowing to enhance established and sustainable structures.



The head of the clinic since 1.02.2020 is Dr. Robert Ndege, who has also finalized his master in Infectious Diseases at the London School of Hygiene and Tropical Medicine. Prof. Dr. Maja Weisser (infectious disease specialist from the University Hospital Basel, Switzerland, head of CDCI 2016-17) continues to support the CDCI as the clinical research coordinator. In 2020, Dr. Jacopo Nicoletti, a specialist in Internal Medicine from the University Hospital Basel has joined the team as the Clinical Coordinator.

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IV. Infrastructure

Since January 2017 the CDCI is located at the outpatient department of SFRH, which has been constructed by the support of the Swiss Agency for Development and Collaboration (SDC). CDCI rooms are on the posterior side of the building with an extra building for TB-patients and an additional testing room within the general patient triage.



The clinic consists of the following rooms: reception, triage, 2 testing and counseling rooms, 6 clinician's offices, blood withdrawal room, 3 drug dispensing rooms (1 CDCI, 1 OSC, 1 TB), trial/infusion room, data and server room, meeting hall, toilets for patients and staff. End of 2020 and beginning of 2021 the renovation of the whole hospital was completed by SDC involving some renovations for the One Stop Clinic, which is integrated in the Reproductive and Child Health Clinic.

The One Stop Clinic, an integrated service clinic for HIV-affected families is located within the Reproductive and Child Health Clinic (RCHC) of SFRH. The pharmacy consists of 2 dispensing rooms at the clinic (CDCI, OSC) and a storage room within the general pharmacy of the SFRH to fulfil storage requirements and to link to the electronic drug management system of the hospital for accountability and ordering of antiretroviral drugs from the governmental pharmacy MSD (ELMIS). The laboratory activities are located within the Ifakara Health Institute laboratory (ISO 9001: 2015 certified), in close proximity to the hospital.

V. Clinical Activities

HIV testing services

Three trained counselors (2 for adult patients, 1 for pediatric patients and families) are in charge of VCT, PITC and index testing according to national guidelines. They are supported by volunteers staying at the clinic for 3-6 months at a time. Since 2019, optimized Provider Initiated Testing and Counseling (PITC) services has been implemented to improve effectiveness of PITC. This involves the screening of all patients that come for outpatient services at SFRH using a standard set of questions, and offer HIV testing services to only those with a higher risk of being infected with HIV infection (as per questions asked). This is being implemented by 6 expert clients (people living with HIV), who are strategically positioned in different testing points within the hospital; they are also required to escort those that test positive for confirmatory testing and linkage into HIV Care and Treatment services.

Testing numbers are registered and reported weekly to hospital staff and district authorities. Additionally, the team takes care of counseling patients with adherence issues on an individual level after documentation of an unsuppressed viral load (>1000 c/ml).

CDCI activities within the Outpatient Department

CDCI not only offers same day treatment ('test and treat' strategy), but additionally a thorough clinical assessment by a medical doctor, and by laboratory testing. The aim is to rule out the important opportunistic infections (e.g. tuberculosis and cryptococcal infections) before the start of treatment. Screening is done for syphilis, hepatitis B, cryptococcal infection and tuberculosis if clinically suspected. In case of diarrhea, stool is analyzed for parasites. The patients are also seen by a counselor to address stigma and help coping patients with the new diagnosis. After successful enrolment in care, patients are closely followed up until their medical situation is stabilized. Upon wish, patients 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 CD4 cell count and viral load as well as safety laboratory. If virologic treatment failure is confirmed, resistance testing can be performed (sequencing).



All patient data is entered into an Open Medical Record System (www.openmrs.org), allowing simultaneous access for all collaborators in charge of patient services (clinicians, triage, registration, pharmacy, laboratory). Questionnaires are standardized to harmonize patient documentation. We continually work on important updates in order to adapt to new guidelines and projects integrated in the CDCI. Within a new collaboration with the IeDEA International epidemiological Databases to Evaluate AIDS in East Africa we further consolidate the data platform and also get some technical support. For the National AIDS Control program, manually completed paper forms continue to be entered into the national database.

Pharmacy

Antiretroviral drugs provided by the Government (sponsored by International Partners) through the

governmental Medical Stores Department (MSD) are ordered through an electronic system according consumption numbers (ELMIS) and dispensed by two pharmacists and a nurse are. During the last years, and even during the COVID lockdown almost no shortages in ARTs occurred. While since April 2019, Dolutegravir-based first-line treatments are implemented (where CDCI was selected as one of the 12 pilot clinics in the country for implementation). We are now participating in the new guideline committee for implementation of third line treatment (Darunavir-based) based on genotypic antiretroviral resistance testing. Women of childbearing age are asked to sign an informed consent or can opt to stay on the previous treatment due to a minimally increased risk of neural tube defects by Dolutegravir.

Reducing attrition and improving Retention in care

Stigma remains a big challenge and a frequent cause of loss to follow-up. An implementational project nested within KIULARCO assesses the value of a bundle of 4 interventions for newly diagnosed patients aiming at reduction of stigma: separate counselling by an HIV-positive lay person, show a locally made video, in which PLHIV tell about their experience, offer of group therapy during waiting times provided by HIV-positive lay counsellors and assessment of stigma and depression scores during the first year. mHealth interventions via mobile phones help to remind people to come to the clinic or and follow-up their whereabouts if they don't.

Routinely, we call patients directly within 2 weeks of a missed visit to ensure their visit attendance. If patients cannot be reached, a network of 15 volunteers funded by USAID Boresha Afya tracks patients at their home, in collaboration with a data clerk from our team. Since implementation of routine viral load testing, we also track patients with a positive viral load results for counseling, retesting and if needed, switch to second-line treatment.

CDCI activities within SFRH Wards

Hospitalized patients with an HIV or TB infection are seen by a designated doctor from the CDCI, who takes care of these patients doing daily ward rounds. Once a week a grand round is conducted under the supervision of the Head of CDCI.

Integration of HIV and Tuberculosis Activities

To better address tuberculosis - the most common comorbidity in HIV-infected patients - services for TB are integrated at CDCI. Confirmation of TB after clinical suspicion and chest x-ray is done with Xpert MTB/RIF from sputum or other material according the tuberculosis and Leprosy National Control Program (NTLP).

Within a prospective trial we did sonography for patients with suspicion of extrapulmonary TB according to the eFASH protocol (extended focused assessment with Sonography for HIV-associated tuberculosis) and test for TB in pleural, pericardial fluid, ascites, cerebrospinal fluid by newest technologies, e.g. Ultra Xpert MTB/RIF and ADA (Adenosine deaminase).



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

To improve services for HIV-infected pregnant and breast-feeding mothers together with their partners, HIV-infected children to reduce/eliminate mother-to-child transmission, the 'One Stop Clinic' was implemented 2013 (initially financed through a Merck for Mothers grant). It is located in the Antenatal and Under-five Clinic of SFRH and consists of a team of three medical doctors, a counselor, a nurse and a receptionist. The team provides care for HIV-infected pregnant women, HIV-exposed and HIV-positive children and their families in one site, unifying all needed services under one roof. Besides clinical care the One Stop Clinic functions as a referral clinic at the Kilombero district. In the last 3 years, it offered twice yearly training for healthcare workers from other districts.

Integration of Malnutrition Services

Since 2016 CDCI runs an implementation project for care of undernourished HIV-positive and negative children, which is funded externally by AfricaViva, a Spanish NGO. Within the project and the national malnutrition collaboration we can offer therapeutic foods to undernourished children. Additionally, nutritional education for caregivers, family members and healthcare workers is a central part. The malnutrition team consists of a nutritionist and a nurse and is supervised by one of our doctors, Dr. G. Mollel, who is also a member of a national stakeholder panel to validate National guidelines on Integrated Management of Acute Malnutrition. We did a training for health care workers and community health workers on management of acute malnutrition and have received students from Mlimba girls Secondary school who came to do their school project on 'how malnutrition affects societies

Additionally, within a grant by ESTHER Switzeland we could successfully start a malnutrition screening project in the district – ensuring children are diagnosed and managed properly (AttainLife).

Cervical Cancer Screening

In conformity with NACP recommendations, Cervical Cancer (CC) Screening is offered twice per week in the CECAP (Cervical cancer prevention clinic) consultation room located in the One Stop Clinic. Within a joint collaboration the University Hospital Basel, Charité Berlin, Swiss TPH, IHI and SFRH from February 2020 CC screening and treatment coverage has been improved, with evidence-based interventions:

- 1) Organization of an e-course on colposcopy on 10-12.3.2020 with Dr A. Kind (University Hospital Basel), Dr B. Frey (Kantonsspital BL), Andreas Kaufman (Charité Berlin) and Ivana Di Salvo (IHI, Swiss TPH, USB)
- 2) Introduction of colposcopy with a Mobile ODT (EVA, system) into the clinics in March 2020
- 3) Introduction of LEEP (Loop electrical excision procedure) with pathology analysis sent to the Lancet laboratory in Dar es Salaam (TZ)
- 4) Development of in-house standard operating procedures for colposcopy, cryotherapy and LEEP

The high-risk population of WLWH enrolled in KIULARCO had benefited from this implementation, that will also lead to an increase of the number of women screened every year. Moreover, the population of the region, including HIV negative patients, has access also to those services. They benefit from more sensitive diagnostic and treatment tools, quality of services and appropriate options. SFRH is now the only hospital in the Morogoro region offering LEEP, before patients were referred to distant health care facilities (Dar es Salaam). From April 2021 HPV testing will be offered in collaboration with IHI laboratory (Bagamoyo branch). The data collected may provide additional information to national authorities and stakeholders to define future strategies.

Community Activities

This year the clinic together with the local implementing partner partners as well as the local government, co-organized several activities at community level, e.g. a visit to the Idete prison for offering HIV and TB education as well as testing services to the inmates as well as the guards and the surrounding community. Every 1st of December, we celebrate World Aids day. The theme for this year's World Aids Day (1st December) which we co-organized at a primary school in Ifakara (Maendeleo) was **“Global Solidarity, Shared Responsibility”**. Various activities we carried out, including the lighting of candles to commemorate those that had passed away from HIV. Other activities included sack racing as well as a football match. Many people attended the event and participated in the many ongoing activities such as Malaria, TB and HIV testing, blood pressure measurement, BMI calculation, cervical cancer screening as well as Blood donation.



Care for HIV-infected mothers and their infants within the Kilombero District

After the successful implementation of a project rolling out One-Stop Clinic activities to peripheral clinics (financed by ESTHER Switzerland 07/2017 – 06/2018), we continue to strengthen care for HIV-infected mothers and their infants within the Kilombero District by training and awareness events at peripheral CTCs and ensuring a district-based circuit for Early Infant Diagnosis. The turnaround time for testing and result delivery could be reduced from several months to two weeks. Within an established sustainable collaboration with District Authorities and USAID Boresha Afya we are about to become an accepted hub for Early Infant Diagnosis for the 3 districts within the area (see below).

VI. 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 in sputum is performed 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, CD4 cell count and newly HIV Viral Load).



Hub for Viral load Testing

IHI laboratory under the lead of Faraji Abilahi has become 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 on becoming a hub for EID same as for viral load to improve services for patients living in remote parts of the area.

VII. Research activities

Projects nested within the ongoing Kilombero and Ulanga Antiretroviral Cohort (KIULARCO) allow to tackle and answer questions regarding treatment outcome, retention in care, co-infections and other comorbidities. The aim of research is to improve patient services by improved knowledge and inform national authorities and impact guidelines. Moreover, the research activities provide a unique opportunity for capacity building and career development of the local staff. Central 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 • 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

Research projects are done in close collaboration with researchers from IHI, Swiss TPH and the University Hospital in Basel. Moreover, we participated in the National Acquired HIV Drug Resistance survey. In addition, we also seek international South-North and South-South collaborations for clinical trials. Currently 4 interventional studies are in place:

- ➔ **Ultrasound to manage Tuberculosis: a randomized controlled 2 center study:** This 2-center trial (Ifakara and Mwananyamala Dar es Salaam) compares the correctness of diagnosis and outcome in patients with suspected extrapulmonary TB adding eFASH to the TB workup vs standard of care. The study has closed recruitment (700 patients) in October 2020 and is now working on completion of follow-up (funded by Rudolf Geigy Foundation and Bangerter Foundation)
- ➔ **Identifying most effective Treatment Strategies to control Arterial Hypertension in sub-Saharan Africa (CoArtha):** This randomized 3-arm trial compares 3 different drug regimens for patients with uncomplicated arterial hypertension in CDCI and SFRH, Ifakara and Mokhotlong, Lesotho (funded by the Swiss National Science Foundation). Recruitment has reached 567 patients and is ongoing.
- ➔ **Genotype-Informed Versus Empiric Management Of VirEmia (Give Move):** In this randomized controlled trial, we assess the role of resistance testing in pediatric HIV patients with a first high Viral load compared to standard of care treatment. Recruiting sites are the One stop Clinic, Ifakara and different sites in Lesotho in collaboration with Solidarmed, Lesotho. Challenges were the COVID-related lockdowns and technical issues with the sequencing machine.
- ➔ **A stigma-related intervention study to improve linkage to care for people living with HIV in resource-limited setting (Stig2Health):** This is a KIULARCO-based pre-post study analyzing improvement of a bundle of 4 stigma-related interventions on linkage and retention in care within the first year

These trials aim at improvement of care in rural sites, but also offer training options and career building. Due to the COVID-related lockdowns all interventional studies were on halt from march to July 2020.



Data from KIULARCO were presented in national and international conferences:

Tanzania Health Summit.

- Dr Gertrud Mollel presented a poster on prevalence & risk factors for postpartum depression in Kilombero valley
- Dr Herieth Wilson presented a poster on Identifying most effective Treatment Strategies to control Arterial Hypertension in sub-Saharan Africa CoArtha



VIII. Training activities

The first working hour every day is reserved for education and training of staff including clinical case discussions, state of the art lectures on HIV and associated diseases, resistance committee and journal clubs. Sessions are coordinated by a team member on a rotational basis, contributing to a continuous medical education and fostering clinical discussion among the team.

During this year, several doctors of the clinic attended the Point of care ultrasound courses at the SFRH which were held 2 times this year.

Dr. Gertrud attended the 29th SSPH+ Lugano Summer School in Public Health Policy, Economics and Management from August 24 to 29, 2020 sponsored by SDC.

In 2020. Dr. Robert Ndege successfully completed the online Master program in Infectious Diseases from University of London. Mrs Aneth Vedastus, statistician started her PhD program under CARTA. Dr. Ezekiel Luoga started his online Master program in Global Health from the University of Suffolk. Leila Samson (counsellor) and Amina Nyuri (lab scientist) started their Master in Public Health With Research under IHI together with the Nelson Mandela African Institution of Science and Technology (NM-AIST) in Bagamoyo. Furthermore, Dr. Herry Mapesi is continuing his PhD program through Swiss Government Excellence Scholarship for foreign scholars and artists (ESKAS) which he started in October 2018.

Namvua Kimera attended trainings on Quality management System, Lab internal Auditing and Root-cause analysis and corrective action. Dorcas Mnzava. attended a workshop on HIV Early Infant Diagnosis and point of care data review under the NACP and Implementing partners. Theonestina Byakuzana. attended an

industrial First Aid course. Dr. Joshua Kapungu attended training on Paediatric Multi-Drug Resistance TB under the National TB and Leprosy program as well as implementing partners.

Due to the COVID pandemics, this year many planned internships of doctors from abroad had to be cancelled. Usually, they contribute to the clinic by seeing patients, providing inputs in clinical and research meetings. Also, there is an option for them to do master or medical thesis within the KIULARCO.

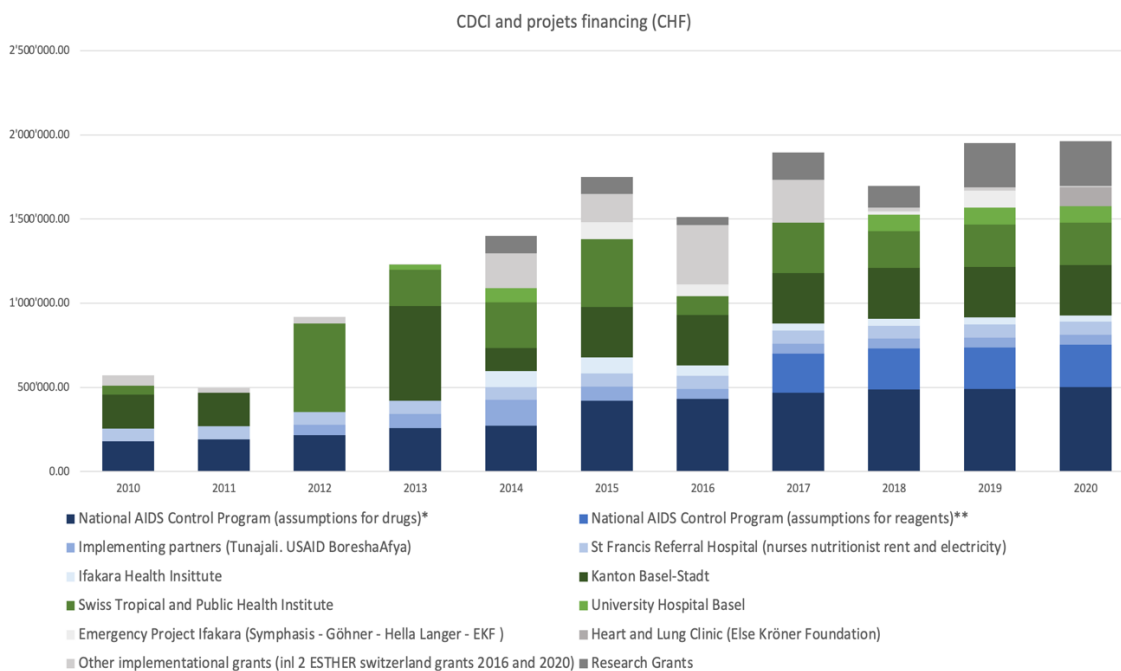
IX. Collaborations/Important Visits

This year we signed the contract with leDEA East Africa for collaboration of the HIV cohort. Two trials are done in collaborations with Niklaus Labhardt's Group (Solidarmed) and a new collaboration for a heart and lung clinic in 2021 was started in collaboration with the Charité Clinic in Berlin.

X. Funding Situation

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 Boresha Afya), the additional activities for quality care, training and improving health through research are funded through the Canton Basel-Stadt, Switzerland, the Swiss Tropical and Public Health Institute, the University Hospital Basel and the Ifakara Health Institute.

Figure 4: Approximate estimation of Funding Contribution to the CDCI



XI. Conclusions

The Services of the Chronic Diseases Clinic could be maintained during 2020 despite lockdown measures for the COVID 19 pandemics. The platform for high-quality care, training and research could be further strengthened thanks to the longstanding and excellent collaboration and support between the key partners. Excellent services continue to result in improved patient outcomes. A strong collaboration with national stakeholders enabled us to become a nationally accepted implementational partner with several members being in national guideline panels. The model character of our clinic to deliver services in rural areas is well perceived and helps to engage motivated collaborations to push the health agenda in Tanzania.



ANNEX I. LIST OF PUBLICATIONS of the CDCI (last 5 years)

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