

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

Annual Report for the year 2018

A collaboration between

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I. Summary

HIV/AIDS remains the number one cause of death in many countries in sub-Saharan Africa despite tremendous achievements over the past 15 years. According to the UNAIDS report 2018, the HIV incidence in Tanzania in 2017 decreased further to 1.36 [1.21–1.55]/1000 persons. Until today the 90-90-90 WHO goals could not yet be reached in Tanzania with the current standing: the current figures for the 1st 90^{ies} are missing, for the 2nd and 3rd 90^{ies} the numbers are 66% and 48%, respectively.

Since 2005 the Chronic Diseases Clinic of Ifakara (CDCI) is the Care and Treatment Center (CTC) for people living with HIV (PLWHIV) of the St. Francis Referral Hospital (SFRH) in Ifakara, Morogoro Region. CDCI is a joint project of the Swiss Tropical and Public Health Institute (Swiss TPH), the Ifakara Health Institute (IHI), the SFRH and the University Hospital Basel (USB). The virological suppression rate within the CDCI is 94% for patients in active care, substantially higher than the current national level, which is as low as 48%.

HIV testing for all in- and outpatients is a major focus of our activity and has been expanded thanks to close collaboration with USAID BoreshaAfya to family members, even if they are not at the hospital. Patients with positive test results are enrolled into care on the same day for start of antiretroviral treatment (following the 'test and treat' principle). 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 programmes, district and national governmental authorities.

The rollout of successful services into the Kilombero, Malinyi, and Ulanga districts (e.g. One Stop Clinic Model, Early Infant Diagnosis and most importantly the reference lab for these districts) are major achievements, improving services for a wider population.

Along with clinical services, CDCI aims at improving care through research and runs a clinical cohort; the Kilombero and Ulanga Antiretroviral Cohort (KIULARCO), that includes consenting patients attending the CDCI. The database contains demographic and clinical information and storage of blood samples providing a unique opportunity to study the epidemiology and needs of patients with HIV primarily in rural Africa. About 10,000 patients have been enrolled, of which 4'000 under active care. The third pillar of CDCI is training and capacity building of young medical doctors, nurses, laboratory scientists and epidemiologists.

Highlights and achievements of 2018 at CDCI

- Establishment of viral load testing for patients from all three districts (Kilombero, Ulanga and Malinyi) at IHI laboratory as the central hub in collaboration with SFRH/USAID Boresha Afya and NACP
- Implementation of index testing for HIV-positive patients (through USAID Boresha Afya)
- Establishment of triage and drug dispensary at the One Stop Clinic/RCH
- Implementation of SMS reminder for clinic visits
- Single-dose liposomal Amphotericin B for patients with cryptococcal meningitis (drug donation)
- Upgrade of the electronic patient data system (OpenMRS) with implementation of an appointment module for tracking
- Visit of Parliamentarians from District in July 2018 and National representatives in August 2018 (IHI)
- Visit Hospital Delegation from the University Hospital Basel, Switzerland in July 2018
- Presentation of scientific work at national and international conferences and several peer-reviewed publications

II. Patient Numbers

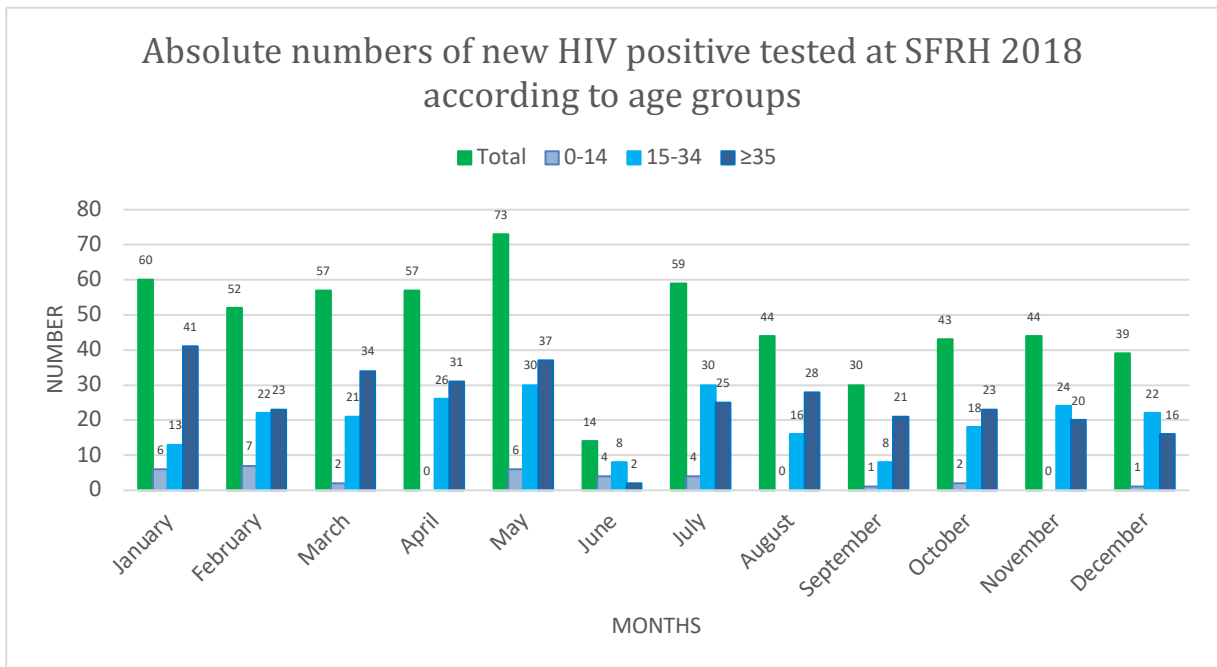
Number of HIV Testing at SFRH 2018

Figure 1 and 2 show HIV test results at the SFRH from January to December 2018 in routine care. Figure 1 shows gender specific overall numbers and percentages. Figure 2 shows age-distribution of positive tests.

Figure 1

	Total	Male	Female
Tested	13'083	5'318	7'765
Positive	572	217	355
Percentage	4.37	4.08	4.57

Figure 2



Testing numbers come from voluntary testing and counseling, out- and inpatient departments.



Number of patients attended in CDCI from January 1st to December 31st

(numbers from the National AIDS Control Database (NACP))

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	6'240	3'386	497	506	
Total, n	9'626		1'003		10'629
Cumulative number of persons on ART, n	5'147	2'631	393	421	
Total, n	7'778		814		8'592

Number of patients enrolled into KIULARCO until December 2018

(numbers from openMRS database)

Figure 3 shows the number of patients enrolled yearly into KIULARCO

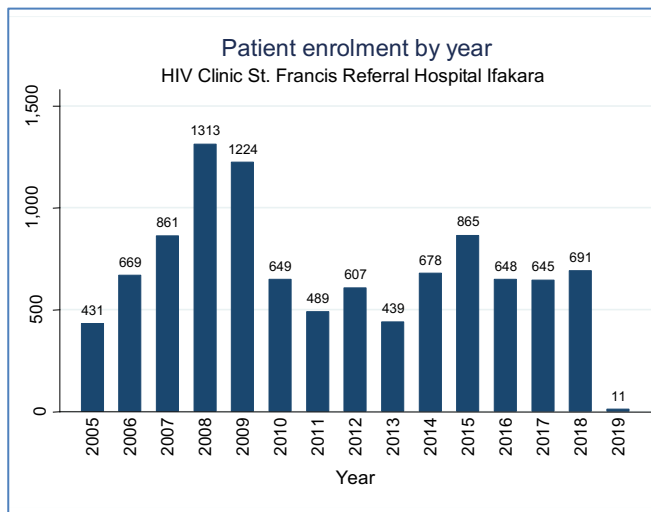


Table 2 shows the details of patients ever and monthly enrolled according the OpenMRS database

KIULARCO monthly report for January - June, 2018 for database updated on 07/01/2019																			
Characteristics	Cumulative numbers 2005 -12/2018	January, 2018			February, 2018			March, 2018			April, 2018			May, 2018			June, 2018		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients¶	691	70	24	46	63	39	24	66	41	25	64	43	21	61	43	18	57	36	21
Total enrolled patients	10'209																		
On active follow-up	4'057	68	23	45	62	39	23	65	41	24	63	43	20	61	43	18	51	33	18
Died	984	0	0	1	1	0	1	1	0	1	1	0	1	0	0	0	3	3	0
Lost to follow-up	3'815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	1'353	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Age at enrolment																			
0 - 15	968	10	3	7	15	4	11	12	7	5	10	4	6	5	3	2	7	5	2
16 - 49	7'818	49	39	10	40	32	8	47	30	17	49	35	14	46	34	12	36	24	12
50 and Above	1'414	11	4	7	8	3	5	7	4	3	5	4	1	10	6	4	14	7	7
Pregnancy status at enrolment																			
No	6'041	42	42	0	35	35	0	36	36	0	39	39	0	35	35	0	34	34	0
Yes	390	4	4	0	4	4	0	5	5	0	4	4	0	8	8	0	2	2	0
ART information																			
Started ART	6'839	37	25	12	33	21	12	40	24	16	35	26	9	45	32	13	37	26	11
Started ART in other clinics	1'395	18	12	6	18	8	10	15	13	2	20	10	10	5	4	1	7	6	1
Never started ART	1'975	15	9	6	12	10	2	11	4	7	9	7	2	11	7	4	13	4	9
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	197'480	1'681	1'137	544	1'583	1'054	529	1'675	1'150	525	1'675	1'138	537	1'822	1'238	584	1'732	1'220	512
Patients on ART and on active follow-up**	3'946	4'466	2'972	1'494	4'426	2'944	1'482	4'381	2'921	1'460	4'330	2'887	1'443	4'302	2'870	1'432	4'269	2'851	1'418

¶New enrolment of a specific year (its from January - Dec, 2018). *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, 2018 for database updated on 07/01/2019																			
Characteristics	Cumulative numbers 2005 - 12/2018	July, 2018			August, 2018			September, 2018			October, 2018			November, 2018			December, 2018		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients¶	691	53	36	17	55	33	22	52	26	26	61	37	24	51	30	21	38	20	18
Total enrolled patients	10'209																		
On active follow-up	4'057	52	35	17	55	33	22	50	26	24	58	35	23	50	30	20	37	19	18
Died	984	1	1	0	0	0	0	1	0	1	0	0	0	1	0	1	1	1	0
Lost to follow-up	3'815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer out	1'353	0	0	0	0	0	0	1	0	1	3	2	1	0	0	0	0	0	0
Age at enrolment																			
0 - 15	968	6	5	1	2	0	2	5	3	2	4	2	2	1	0	1	2	0	2
16 - 49	7'818	43	28	15	45	31	14	34	19	15	45	29	16	42	25	17	29	16	13
50 and Above	1'414	4	3	1	8	2	6	13	4	9	12	6	6	8	5	3	7	4	3
Pregnancy status at enrolment																			
No	6'041	30	30	0	31	31	0	24	24	0	32	32	0	25	25	0	18	18	0
Yes	390	4	4	0	2	2	0	2	2	0	5	5	0	5	5	0	2	2	0
ART information																			
Started ART	6'839	37	29	8	34	20	14	31	18	13	36	21	15	29	21	8	26	15	11
Started ART in other clinics	1'395	6	4	2	9	6	3	7	4	3	10	8	2	11	4	7	4	1	3
Never started ART	1'975	10	3	7	12	7	5	14	4	10	15	8	7	11	5	6	8	4	4
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	197'480	1'770	1'223	547	1'764	1'202	562	1'623	1'122	501	1'815	1'239	576	1'757	1'213	544	1'508	1'026	482
Patients on ART and on active follow-up**	3'946	4'220	2'822	1'398	4'180	2'794	1'386	4'133	2'761	1'372	4'055	2'717	1'338	4'007	2'684	1'323	3'946	2'643	1'303

¶New enrolment of a specific year (its from January - December, 2018). *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

Forty local staff members are employed at the CDCI by four different organizations, namely IHI/Swiss TPH (n=25), SFRH (n=6), USAID-BORESHA AFYA (n=8), and Swiss TPH (n=1). Additionally, 6 persons work on granted research or implementation projects. The CDCI team is currently composed of 8 medical doctors, 1 clinical officer, 7 nurses, 3 counselors, 5 auxiliary nurses, 1 nutritionist, 2 pharmacists, 2 statisticians, 6 data clerks, 4 biologists, 1 lab technician and 6 auxiliary staff. The team has been quite stable over the past several years, allowing to enhance established structures.

The head of the clinic from January 1st to September 30th 2018 was Dr. H. Mapesi, a senior doctor from the clinic. Starting in October 1st 2018 Dr. A. Eichenberger, a specialist in Internal Medicine, from the University Hospital Berne, Switzerland took over as Dr. H. Mapesi started his PhD at the University of Basel. PD Dr. M. 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.

IV. Infrastructure

Since January 2017 the CDCI is located at the outpatient department of SFRH, which has been constructed with 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 tuberculosis patients and an additional testing room within the general patient triage.

The clinic consists of the following rooms

- Reception
- Triage
- Testing and counseling rooms (n=2)
- Clinician's offices (n=6)
- Blood withdrawal room
- Drug dispensing rooms (1 HIV, 1 tuberculosis)
- Trial/infusion room
- Data and server room
- Meeting hall
- Toilets for patients and staff

The One Stop Clinic, the integrated service clinic for HIV-affected families is located within the Reproductive and Child Health Clinic (RCHC) of SFRH.



The pharmacy storage room remained within the SFRH in order to closely link to the hospital pharmacy with an integrated electronic system to order antiretroviral drugs from the governmental pharmacy MSD (ELMIS). The drug dispensing rooms are located at the adult clinic and at the RCHC. The laboratory activities are located within the IHI laboratory (ISO 9001: 2015 certified), in close proximity to the hospital.

V. Clinical Activities

HIV testing services

Three trained counselors (2 for adult patients and 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 our clinic for 3-6 months at a time. Testing numbers are registered and weekly reported to hospital staff and to the district authorities. Additionally, the team takes care of counseling patients with adherence issues on an individual patient level after documentation of an unsuppressed viral load of above 1'000 copies/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 diarrhoea, stool is examined 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 centre 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).

Improving retention in care

To tackle retention in care, patients are called within 2 weeks of a missed visit. If patients cannot be reached, a network of more than 30 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 tuberculosis infection are seen by a designated doctor from the CDCI, who takes care of these patients together with an intern from the SFRH 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

Tuberculosis is the most common comorbidity in HIV-infected patients. Services for both diseases are integrated into CDCI allowing early screening, proper management of co-infections in a patient-centered care model. Confirmation of tuberculosis after clinical suspicion and chest xray is done with Xpert MTB/RIF from sputum according to the Tuberculosis and Leprosy National Control Programme (NTLP).

Patients with a sputum-positive tuberculosis are enrolled in a clinical cohort (TB DAR), a collaborative project with IHI Bagamoyo and Temeke. Sputum is sent for culture to IHI laboratory in Bagamoyo. Within research projects, other materials such as pleural, pericardial fluid, ascites, cerebrospinal fluid are tested by latest technologies, e.g. Ultra Xpert MTB/RIF. Sonography is integrated in case of suspicion of extrapulmonary tuberculosis according to the FASH protocol (focused assessment with sonography for HIV-associated tuberculosis) and its value is currently examined in a randomized-controlled trial.

According to government requirements, the setup of a ward and outpatient department to treat multidrug resistance (MDR) tuberculosis is planned in order for SFRH to become one of the referral centers for MDR-TB in Tanzania.



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

We developed a model clinic to improve services for HIV-infected pregnant women and to reduce/eliminate mother-to-child transmission. The 'One Stop Clinic' was implemented 2013 initially with a project financed through a Grant from 'Merck for Mothers' and since the beginning of 2018 is integrated in CDCI. It is located in the Antenatal and Under-five Clinic of SFRH and consists of a team of two 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. Over the past 3 years, it offered twice yearly training for healthcare workers from other districts and organizes community-activities. For instance, during this years' World AIDS day an event containing specific information and HIV testing was organized held at a primary school in Ifakara (Mhola).

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

From July 2017 to June 2018, we successfully implemented a project funded by ESTHER Switzerland. The aim was to improve 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. As a result of the project, which is now closed, we have established a sustainable collaboration with district authorities and USAID Boresha Afya and are about to become an accepted hub for early infant diagnosis for the 3 districts within the area (see below).



Paperless clinic

This year there was significant progress to monitor patients. We managed to successfully upgrade our openMRS electronic patient database, which is in place since June 2013 (Open Medical Record System; www.openmrs.org). The electronic system allows simultaneous access for all collaborators in charge of patient services (clinicians, triage, registration, pharmacy and laboratory) and harmonizes patient documentation. For the National AIDS Control Programme (NACP), manually completed paper forms are additionally entered into the national database, which was also successfully updated this year. NACP works currently on an openMRS-based database to be implemented the coming years.



Pharmacy

The supply chain for antiretroviral drugs is organized by the Government (sponsored by International Partners) through the governmental Medical Stores Department (MSD). Drugs are ordered in an electronic system according consumption (ELMIS). Two pharmacists and a nurse are dispensing drugs at the CDCI with support from the hospital pharmacy. During the last years, almost no shortages in ARTs occurred. The NACP announced for next year the availability of a new class of ARTs, the integrase inhibitors, which so far has not been available, the replacement of tenofovir disoproxil fumarate with tenofovir-alafenamide, a less toxic formulation and the addition of the protease inhibitor darunavir with a high efficacy and excellent safety profile.

Implementation of a malnutrition project

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. Thanks to the project, we have become part of the national malnutrition collaboration and now can order therapeutic foods within government programmes. Besides delivery of therapeutic foods, nutritional education for caregivers, family members and healthcare workers is a central part. The project has been fully integrated into hospital routine. 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.

VI. Laboratory activities

Monitoring of HIV-therapy and screening and diagnosis of opportunistic infections

Laboratory screening and monitoring is done as per NACP guidelines. At baseline, full blood and CD4 counts, creatinine, transaminases, screening for syphilis (VDRL), chest X ray and chronic hepatitis B (HBsAg) is done. Additionally, patients with a CD4 cell count $<150/\text{mm}^3$ receive a cryptococcal antigen test. In patients with symptoms for tuberculosis, an Xpert TB/RIF in sputum is performed. Stool is examined 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

After joint efforts from IHI, SFRH and support of USAID Boresha Afya IHI laboratory under the lead of Faraji Abilahi has become the hub for viral load testing for Kilombero, Malinyi and Ulanga districts. Results are directly reported by an electronic system to NACP. During the first month, more than 1'000 samples have been tested (481 from our CTC, 575 from the district) with a turnaround time of only 2 days. The median virological suppression rate in the district was 85%, and for the CDCI it was 94%. Besides the direct impact on health of patients (timely switch to an effective treatment in case of failure, 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-week 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.

VII. Research activities

Projects nested within the ongoing Kilombero and Ulanga Antiretroviral Cohort (KIULARCO) allow to tackle and answer specific research 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 on the need and management of HIV/AIDS patient in a peripheral rural area of the country. Moreover, the research activities provide a unique opportunity for capacity building and career development of the local staff. On this existing platform, we now start interventional clinical trials to have an even stronger influence on patients' health addressing the following topics:

Research strategy:

1. **Treatment outcome in people living with HIV/AIDS**
 - Virological outcome and resistance development
 - Adherence/loss to follow-up
2. **Comorbidities**
 - Non-communicable diseases
 - tuberculosis-HIV co-infection/sonography in tuberculosis
3. **Maternal and child health in HIV**
 - Mother-to-child transmission
 - Pediatric HIV infection
 - Adolescents

Research projects are done in close collaboration with researchers from IHI, Swiss TPH and the University of Basel. We seek international South-North and South-South collaborations. For example, we participate in a multisite study coming from the Drugs for Neglected Diseases Initiative (DNDi) evaluating for Lopinavir/ritonavir pellet formulations in children up to 3 years in Kenya, Uganda and Tanzania. An upcoming collaboration will be with SolidarMed Lesotho for a multisite trial in pediatric HIV. Also, on a national level, we build up collaboration with other sites – e.g. tuberculosis studies with Dar es Salaam (Temeke and Mwananyamala Hospitals) and Bagamoyo (laboratory).

This year, research funding proposals for clinical trials have been submitted and are currently with pending answers. A list of publications of the CDCI can be found in Annex I.

We presented data from KIULARCO in several international conferences this year:

International AIDS Society's Conference in Amsterdam, Netherland France, July 2018

- Aneth Vedastus Kalinjuma: Trends of body mass index in HIV-positive patients receiving antiretroviral Treatment in Rural Tanzania (Poster)
- Chloe Schlaeppli: Prevalence and management of drug-drug interactions in a rural Tanzanian HIV cohort (Poster)

AMEE (Association for Medical Education in Europe); August 2018

- Reginna Ndaki: Evaluation of a train-the-trainer (TtT) programme to improve patient centered communication (PCC) in treating patients with adherence problems in a rural hospital in Tanzania

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. Each session is coordinated by a team member on a rotational basis, thereby contributing to a continuous medical education and fostering clinical discussion among the members of the team.

This year, 2 medical doctors from CDCI started a MSc program: Dr. R. Ndege an online MSc program in Infectious Diseases from University of London, Dr. G. Mollel at the London University. J. Mkumbo, member from the data team went for a 2-year MSc program at the Carenegie Mellon University Africa in Kigali, Rwanda. Two team members won a PhD program through Swiss Government Excellence Scholarship for Foreign Scholars and Artists (ESKAS): Dr. H. Mapesi and A.J. Ntamatungiro. One lab scientist came back from a MSc programme: N. Kimera, a laboratory scientist. Additionally, doctors from abroad come for 4-6 months-internships to get insight and experience in medicine in rural Africa. 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 were honored by two important visits by Members of the Tanzanian Parliament and by a delegation of the University Hospital Basel, Switzerland.

Visit from members of the Tanzanian Parliament

In September 2018 the Parliamentary Committee on HIV/AIDS Affairs and Drug Abuse visited IHI in Ifakara. The chairman, Mr O. Mukasa, and also Former First Lady Salma Kikwete were present. Among the aims of the visit was the strengthening of the collaboration between IHI and national stakeholders, with a focus on HIV research. IHI Chief Executive Director, Dr. Honorati Masanja, led staff of the institute in receiving the MPs who traveled all the way from Dodoma where they're attending parliamentary sessions.



Delegation from the University Hospital Basel

In July 2018, a delegation from the University Hospital Basel (USB) headed by Dr. W. Kübler (CEO), Prof Dr. M. Tanner (Hospital Board Member) and Prof. Dr. A. Urwyler (Hospital Directors Board Member), Prof. Dr. M. Battegay (Head of the Department of Infectious Diseases and Hospital Epidemiology), PD Dr. A. Kind (Staff Physician Obstetrics and Gynecology) visited IHI and specifically CDCI. The University Hospital Basel is a longterm partner of the project, and the visit allowed for a better understanding of current needs and opportunities for further collaboration and support. Two partnership support letters between USB and SFRH and between USB and IHI were signed.



X. Conclusions

The longstanding and excellent collaboration between Swiss TPH, IHI, the University Hospital Basel and the SFRH are key for the sustainability and high effectiveness of this project: essential support is obtained since over 15 years by the financial commitment of the Canton Basel-Stadt, and now by the University Hospital Basel. Excellent services have resulted in improved patient outcomes, now made visible by virologic suppression rates in comparison to other rural CTCs. Close collaboration with the district authorities enabled to extend the advantages of this model clinic to the more rural areas of the district. In continued good collaboration with national stakeholders and government authorities the aim is to scale up the successful interventions learned from CDCI and OSC on a national level.

The unique combination of clinical care for now more than 10'000 patients, clinical training of medical staff and research in this rural African setting, is key for the success of this project. The strong links with national and international partners providing expertise in different areas and commitment to patients' health and most importantly the ongoing motivation of the local team are the key to working towards an AIDS-free world.



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

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