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

Annual Report for the year 2019

A collaboration between

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- **Swiss Tropical and Public Health Institute** (Swiss TPH), Basel, University of Basel, Switzerland (Director: Prof. Dr. J. Utzinger, SwissTPH country Representative: Ch. Lengeler; Head of Program: Prof. Dr. D.H. Paris, Data Responsible: T. Glass and Fiona Vanobberghen)
- **University Hospital Basel**, (Hospital Director: Dr. W. Kübler, Hospital Board: Prof. M. Tanner, Prof. Dr. A. Urwyler; Head of Division of Infectious Diseases & Hospital Epidemiology: Prof. Dr. M. Battegay, Clinical Research Coordinator CDCI: Prof. Dr, M. Weisser)

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Dr. med. Ezekiel Luoga

Ifakara, 13.01.2019

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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 2019, the HIV prevalence in Tanzania was 4.6% in 2018 and the incidence 1.41/1000 population. New infections have decreased from 83'000 in 2010 to 72'000 in 2018. However, to reach the 90-90-90 WHO goals by 2020 remains a challenge: Currently 78% people know their HIV status (1st 90); 71% of people living with HIV (PLHIV) are in care (2nd 90) and 62% of PLHIV are virally suppressed (3rd 90).

Since 2005 the Chronic Diseases Clinic of Ifakara (CDCI) is the Care and Treatment Center (CTC) for PLHIV 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. HIV testing is a main focus for all in- and outpatients and has been expanded greatly thanks to close collaboration with USAID Boresha Afya. Patients with a positive test result are enrolled into care on the same day for 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 virological suppression rate within the clinic is 87% for patients in active care, substantially higher than the current national level (which is at 62%). This year Dolutegravir-based antiretroviral therapy was implemented. Activities in the 3 districts (Kilombero, Malinyi, and Ulanga) such as Early Infant Diagnosis and mentorship of peripheral HIV clinics with a focus on pediatric and adolescent patients have been strengthened. The IHI laboratory has further developed its function as a hub for viral load testing for the whole district, improving services for a wider population.

Along with clinical services, CDCI runs a well-established research platform aiming at improving care by characterization of clinical presentations of patients, analyzing treatment outcome and comorbidities. This is possible through 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 10,000 patients have been enrolled- 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 2019 at CDCI

- Roll-out of an integrase inhibitor-based first line antiretroviral therapy (dolutegravir, 3TC, Tenofovir), whereby our clinic served was selected as one of the first to start the national rollout
- Implementing screening questions by PLHIV lay persons to select patients who should be offered HIV testing in the outpatient department and special clinics of SFRH
- Strengthening of Viral Load Testing for patients from all 3 districts (Kilombero, Ulanga, Malinyi) at IHI laboratory as the central hub in collaboration with SFRH/USAID Boresha Afya and NACP
- Improvement of the electronic patient data system (OpenMRS) with a new form for hospitalized patients
- Visit of the CEO and a delegation of Novartis for establishment of possible future collaborations
- Visit of USAID ambassador for consolidation of our collaboration
- Preparation of 3 clinical trials (1. Genotype-informed treatment decision in children and adolescents failing on first line treatment, 2. Identifying best treatment strategies for arterial hypertension in sub-Saharan Africa and 3. Reducing stigma in newly diagnosed PLHIV to tackle attrition to care (start early 2020)
- Visit of IeDEA (international epidemiology databases to evaluate AIDS) to establish a partnership
- Presentation of Scientific Work at National and International Conferences (e.g. the European AIDS Clinical Society in Basel, Switzerland in November 2019)

II. Patient Numbers

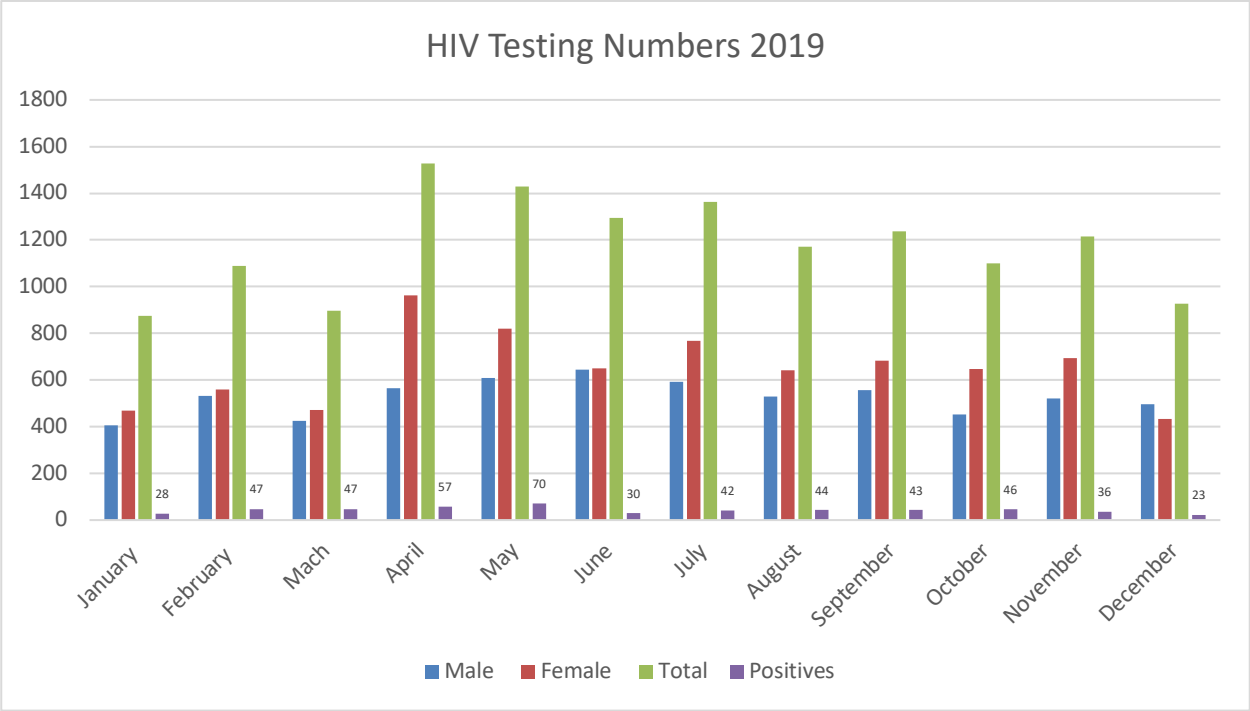
Number of HIV Testing at SFRH 2019

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 1

	Total	Male	Female
Tested	14126	6’324	7'802
Positive	513		
Percentage	3.6		

Figure 2 *Testing numbers come from voluntary testing and counseling, out- and inpatient departments*



Number of patients attended in CDCI 1.1.-31.12.2019

(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)		
	Female	**Male**	**Female**	**Male**	**Total**
Cumulative number of persons enrolled, n	6'498	3'525	521	520	
Total, n	10'023		1'041		11'064
Cumulative number of persons on ART, n	5'697	2'898	451	471	
Total, n	8'595		922		9'517

Number of patients enrolled into KIULARCO until August 16th, 2019

(preliminary numbers form openMRS database)

Figure 3 shows the number of patients enrolled yearly into KIULARCO

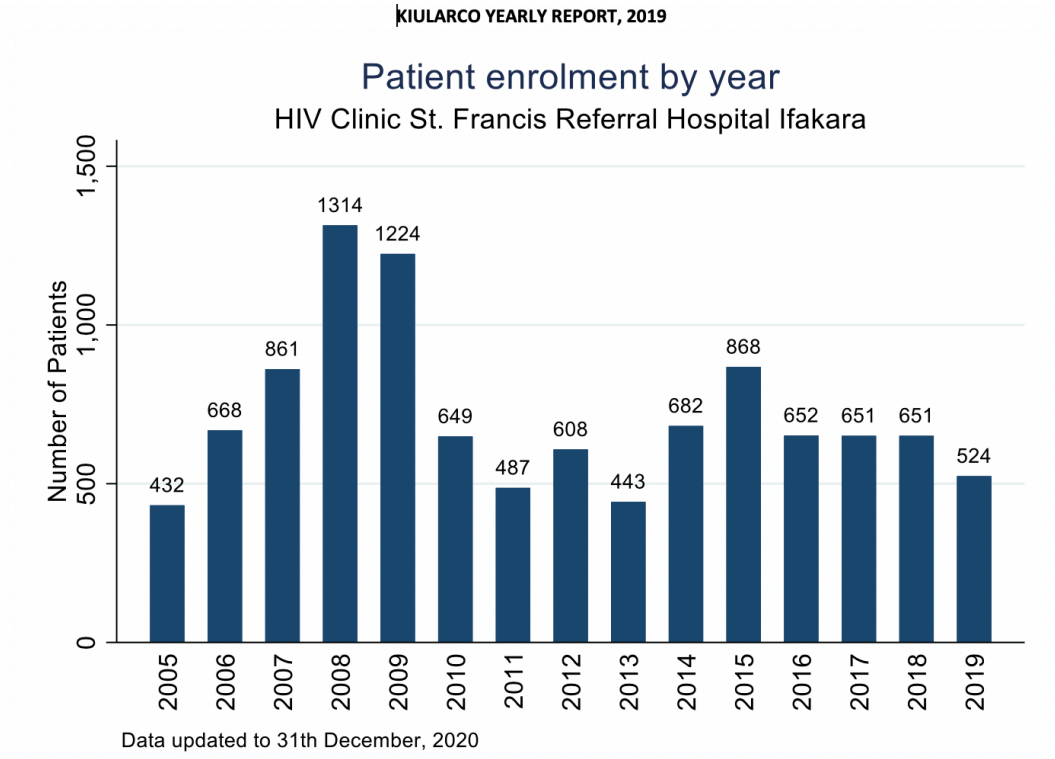


Table 2 shows the details of patients ever and monthly enrolled according the OpenMRS database (until 16th August 2019)

KIULARCO monthly report for January 2019 - December, 2019 for database updated upto 31/12/2019

Characteristics	Cumulative 2005-2019	January, 2019			February, 2019			March, 2019			April, 2019			May, 2019			June, 2019		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients¶	524	49	32	17	43	24	19	46	26	20	47	31	16	51	30	21	30	17	13
Total enrolled patients	10'714																		
On active follow-up	4'098	49	32	17	42	23	19	46	26	20	45	29	16	50	29	21	30	17	13
Died	1'053	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	1	1	0	0	0	0	2	2	0	1	1	0	0	0	0
Age at enrolment																			
0 - 15	1'014	4	2	2	3	3	0	3	3	0	5	2	3	3	0	3	1	1	0
16 - 49	8'192	36	23	13	35	19	16	36	21	15	35	25	10	42	27	15	26	14	15
50 and Above	1'499	9	7	2	5	2	3	7	2	5	7	4	3	6	3	3	3	1	2
Pregnancy status at enrolment																			
No	6'344	30	30	0	23	23	0	23	23	0	29	29	0	24	24	0	14	14	0
Yes	424	2	2	0	1	1	0	3	3	0	2	2	0	6	6	0	3	3	0
ART information																			
Started ART	7'487	35	21	14	24	15	9	20	11	9	38	23	15	35	25	10	17	9	8
Started ART in other clinics	1'269	11	8	3	11	6	5	11	8	3	2	2	0	4	2	2	6	3	3
Never started ART	1'958	3	3	0	8	3	5	15	7	8	7	6	1	12	3	9	7	5	2
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	217'699	1'800	1'213	587	1'584	1'090	494	1'705	1'160	545	1'699	1'161	538	1'680	1'156	524	1'563	1'071	492
Patients on ART and on active follow-up**	4'006	4'563	3'056	1'507	4'513	3'029	1'484	4'476	3'001	1'475	4'422	2'968	1'454	4'376	2'936	1'440	4'349	2'923	1'426

¶New enrolment of a specific year (its from January -August 16, 2019). *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 refil or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.

Characteristics	Cumulative 2005-2019	July, 2019			August, 2019			September, 2019			October, 2019			November, 2019			December, 2019		
		All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male	All	Female	Male
Newly enrolled patients¶	524	42	26	16	41	29	12	47	29	18	53	42	11	48	30	18	27	21	6
Total enrolled patients	10'714																		
On active follow-up	4'098	41	25	16	40	28	12	47	29	18	52	42	10	47	30	17	27	21	6
Died	1'053	1	1	0	1	1	0	0	0	0	1	0	1	1	0	1	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Age at enrolment																			
0 - 15	1'014	4	2	2	0	0	0	8	3	5	5	5	0	7	3	4	2	2	0
16 - 49	8'192	30	19	11	35	25	10	30	18	12	41	33	8	36	23	13	21	16	5
50 and Above	1'499	8	5	3	6	4	2	9	8	1	7	4	3	5	4	1	4	3	1
Pregnancy status at enrolment																			
No	6'344	23	23	0	26	26	0	27	27	0	37	37	0	29	29	0	20	20	0
Yes	424	3	3	0	3	3	0	2	2	0	5	5	0	1	1	0	1	1	0
ART information																			
Started ART	7'487	29	18	11	28	21	7	32	18	14	36	28	8	35	22	13	13	9	4
Started ART in other clinics	1'269	6	4	2	9	6	3	7	5	2	8	8	0	4	3	1	5	5	0
Never started ART	1'958	7	4	3	4	2	2	8	6	2	9	6	3	9	5	4	9	7	2
All enrolled patients																			
Follow-up visits*																			
Cumulative number of visits	217'699	1'753	1'206	547	1'633	1'152	481	1'631	1'114	517	1'778	1'268	510	1'678	1'173	505	1'601	1'101	500
Patients on ART and on active follow-up**	4'006	4'291	2'880	1'411	4'239	2'849	1'390	4'181	2'812	1'369	4'135	2'784	1'351	4'075	2'739	1'336	4'006	2'698	1'308

¶New enrolment of a specific year (its from January -August 16, 2019). *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 refil or when they are sick and they need clinical consultation. **In each month this is cumulative number from 2005.

U=U

Undetectable = Untransmittable

III. Staff of the CDCI

Forty-one local staff members are employed at the CDCI by five different organizations, namely: IHI/Swiss TPH (21), IHI/USB (2), SFRH (6), 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 1.10.2018 is Dr. Anna Eichenberger, a specialist in Internal Medicine, from the University Hospital Berne, Switzerland. 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. Robert Ndege will take over the lead from Dr. Eichenberger.

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.

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 this year 6 people living with HIV are screening patients with a standard

set of questions at the outpatient and specialized clinic of SFRH prior to HIV testing and escorting them for registration after being tested to be HIV positive. 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).



Reducing attrition and improving Retention in care

Stigma remains a big challenge and a frequent cause of loss to follow-up. We therefore started an implementational project to assess the value of a bundle of 4 interventions for newly diagnosed patients aiming at reduction of stigma: Newly diagnosed PLHIW will have a separate counselling by an HIV-positive lay person, they will be shown a locally made video, in which PLHIV tell about their experience, we offer group therapy during waiting times provided by HIV-positive lay counsellors and assess 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

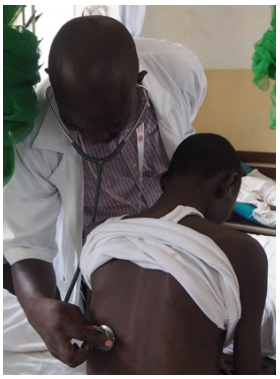
care of these patients together with an intern from the SFRH doing daily ward rounds. Once a week a grand round is conducted under the supervision of the Head of CDCI.

Integration of HIV and Tuberculosis Activities

To better address tuberculosis - the most common comorbidity in HIV-infected patients - services for both diseases 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).

Patients with a sputum-positive TB 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 a prospective trial we do 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 (Adenosin 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.

Community Activities

This year the clinic co-organized in several activities at community level, e.g. events like the annual 'Nane Nane exhibition' from 6-8th August in Morogoro. Clinic activities were presented and

Information on HIV, as well as testing and counseling were offered to the community.

For World AIDS Day on 1st December we organized festivities at as primary school in Ifakara (Jongo). Our this years' message to the community was "undetectable is untransmittable" (in Swahili: "havisomeki ni havisambazwi"). A main activity was a 6 and 3 km fun run through the town. The day was a great success with many people attending for games and festivities, testing for HIV, malaria, blood pressure, BMI and cervical cancer screening.



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).

Paperless Clinic

Since June 2013 the Open Medical Record System (www.openmrs.org) system allows simultaneous access for all collaborators in charge of patient services (clinicians, triage, registration, pharmacy, laboratory) and harmonizes patient documentation. We work on important updates since 2018 and collaborate with funders of openMRS from Uganda, whereby a consultant supports to keep the database uptodate and integrate new forms and needed adaptation. For the National AIDS Control program, manually completed paper forms continue to be entered into the national database.

Pharmacy

Antiretroviral drugs are provided by the Government (sponsored by International Partners) through the governmental Medical Stores Department (MSD) through an electronic system according consumption numbers (ELMIS). Two pharmacists and a nurse are dispensing drugs at the CDCI. During the last years, almost no shortages in ARTs occurred. In April 2019, CDCI was selected as one of the first 12 clinics in the country to roll-out of a new class of ARTs, the integrase inhibitors, which so far has not been available. Virally suppressed patients on first line treatment (2 nucleoside reverse transcriptase inhibitors and a non-nucleoside reverse transcriptase inhibitor) have since then been switched to the new regimen, consisting of Dolutegravir, Tenofovir and Lamivudine in a single pill formulation. 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. The advantage of integrase inhibitors such as Dolutegravir are the much quicker viral suppression with reduction of the risk of onwards viral transmission, the higher barrier to resistance than NNRTIs and the good safety profile.

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. Thanks to the project, we have become part of the national malnutrition collaboration and now can order therapeutic foods within government programs. 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 National AIDS Control 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/ul receive a cryptococcal antigen test. In patients with symptoms for TB, an Xpert TB/RIF in sputum 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

Since 2018, the 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 many 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. Central topics are:

1. **Treatment outcome in people living with HIV/AIDS**
    - Virologic outcome and resistance development
    - Adherence/Loss to Follow up
2. **Comorbidities**
    - Non-communicable diseases
    - TB-HIV co-infection/sonography in TB
3. **Maternal and Child health in HIV**
    - 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. We seek international South-North and South-South collaborations. E.g. we participated 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.
To further strengthen the platform, we have expanded clinical trial activities in collaboration with other sites:

➔ **Ultrasound to manage Tuberculosis: a randomized controlled 2 center study**
This trial compares the correctness of diagnosis and outcome in patients with suspected extrapulmonary TB managed adding eFASH protocol to the TB workup vs standard of care. The study is performed in CDCI, Ifakara and Mwananyamala Hospital, Dar es Salaam in collaboration with the TB laboratory in Bagamoyo (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 patetints with uncomplicated arterial hypertension in CDCI and SFRH, Ifakara and Mokhotlong Hospital, Lesotho (funded by the Swiss National Science Foundation)

➔ **Genotype-Informed Versus Empiric Management Of VirEmia (Give Move)**
In this randomized controlled trial, we will assess the role of resistance testing in pediatric HIV patients with a first high Viral load compared to standard of care treatment. The study will be performed at the One stop Clinic, Ifakara and different sites in Lesotho in collaboration with Solidarmed, Lesotho.

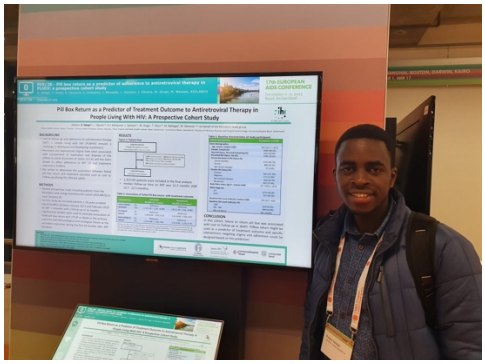
➔ **A stigma-related intervention study to improve linkage to care for people living with HIV in resource-limited setting (Stig2Health)**
This is a KIULARCO-based pre-post study analyzing improvement of a bundle of 4 stigma-related interventions on linkage and retention in care within the first year

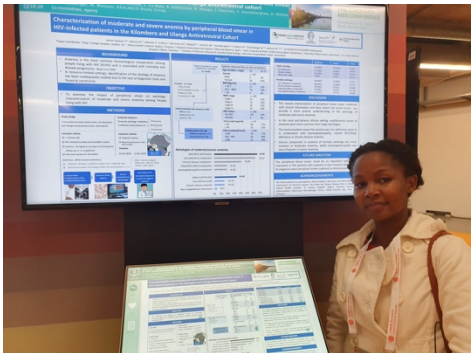
These trials aim at improvement of care in rural sites, but also offer training options and career building

Data from KIULARCO were presented in national and international conferences:

EACS 2019

- Robert Ndege: Pill Box Return as a Predictor of Adherence to Antiretroviral Therapy in PLHIV: A Prospective Cohort Study (E-Poster)
- Dorcas Mnzava/Vanesa Vazquez: Characterization of moderate and severe anemia by peripheral blood smear in HIV infected patients in the Kilombero and Ulanga Antiretroviral Cohort (E- Poster)





IHI Scientific Conference in Bagamoyo 6-8th February 2019

- Anna Eichenberger, Maja Weisser, Lilian Moshi, Namvua Kimera and Aneth Vedastus presented projects

Hubert Kairuki Memorial University Convocation 2019

- Robert Ndege presented KIULARCO and FASH clinical trial

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 3 times this year.

Dr. Gertrud Mollel from the One Stop Clinic completed a master program MSc in Global Health and Development at the University College London in October 2019. Dr. Robert Ndege successfully completed the first part of a two-year online Master program in Infectious Diseases from University of London. Mrs Aneth Vedastus, statistician went for a 3 months fellowship at Harvard University. Furthermore, doctor Herry Mapesi is continuing his PhD program through Swiss Government Excellence Scholarship for foreign scholars and artists (ESKAS) which he started in October 2018.

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 the visit of the chargé d'affaires (Immi Patterson) of the American Embassy, who oversees activities from our collaborator USAIDS/Boresha Afya.

Another important visit to IHI and the CDCI was by Dr. Vas Narasimhan, the CEO of Novartis together with a delegation. On a follow-up visit, Dr. Lutz Hegemann, Head, Global Health Development Unit, Novartis came back to Ifakara for further discussion on possible future collaborations.

We also had a visit from the principal investigators and data manager from IeDEA East Africa in order to join the consortium for future research projects.

X. Conclusions

The Chronic Diseases Clinic and its 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 have resulted in improved patient outcomes, visible by high virologic suppression rates – the most important goal to curb the HIV epidemic and decrease numbers of new infections. Close collaboration with the district authorities and national stakeholders enabled to become a nationally accepted implementational partner and extend the advantages of this model clinic to the more rural areas of the district. Young colleagues now step up to become leaders in the field of HIV, TB and comorbidities and impact national policies and guidelines.


UKUMBI WA MIKUTANO

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

1. Nyogea D, Mtenga S, Henning L, Franzeck FC, Glass TR, Letang E, Tanner M, Geubbels E. **Determinants of antiretroviral adherence among HIV positive children and teenagers in rural Tanzania: a mixed methods study.** *BMC Infect. Dis. 2015 Jan 31; 15(1)28. Epub ahead of print*

2. Haraka F,Glass TR, Sikalengo G, Gamell A, Ntamatungiro A, Hatz C, Tanner M, Furrer H, Battegay and Letang E. **A Bundle of Services Increased Ascertainment of Tuberculosis among HIV-infected Individuals Enrolled in a HIV Cohort in Rural Sub-Saharan Africa.***PLoS One 2015 (in press).*

3. Mapesi H, Ramírez A, Hatz C and Letang E. **Nodular Lymphangitis in HIV-Infected Patients in Tanzania.** *East Afr. Med. Jour. 92(3) March 2015.*

4. Faini D, Maokola W, Furrer H, Hatz C, Battegay M, Tanner M, Denning DW, Letang E. **Burden of serious fungal infections in Tanzania.** Mycoses. 2015 Oct;58 Suppl 5:70-9.

5. Gamell A, Ntamatungiro AJ, Battegay M, Letang E. **Disseminated tuberculosis in an HIV-infected child: rifampicin resistance detected by GeneXpert in a lymph node aspirate but not in cerebrospinal fluid.** BMJ Case Rep. 2015 Aug 3;2015. pii: bcr2014207997.

6. Molefi M, Chofle AA, Molloy SF, Kalluvya S, Changalucha JM, Cainelli F, Leeme T, Lekwape N, Goldberg DW, Haverkamp M, Bisson GP, Perfect JR, Letang E, Fenner L, Meintjes G, Burton R, Makadzange T, Ndhlovu CE, Hope W, Harrison TS, Jarvis JN. **AMBITION-cm: intermittent high dose AmBisome on a high dose fluconazole backbone forcryptococcal meningitis induction therapy in sub-Saharan Africa: study protocol for a randomized controlled trial**. Trials. 2015 Jun 17;16:276.

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9. Winter A, Letang E, Kalinjuma AV, Kimera N, Ntamatungiro A, Glass T, Moradpour D, Sahli R, Le Gal F, Furrer H, Wandeler G; KIULARCO Study group. **Absence of Hepatitis Delta Infection in a Large Rural HIV Cohort in Tanzania**. Int J Infect Dis. 2016 Mar 17

10. Leuenberger A, Nassoro T, Said K, Fenner L, Sikalengo G, Letang E, Montresor A, Zhou XN, Steinmann P, Marti H, Utzinger J, Knopp S. **Assessing stool quantities generated by three specific Kato-Katz thick smear te plates employed in different settings.** Infect Dis Poverty. 2016 Jul 1;5(1):58.

11. Ramirez A, Glass, TR, Winter A, Kimvera N, Ntamatungiro, A, Hatz Ch, Tanner M, Battegay M, Furrer H, Wandeler G, Letang E, KIULARCO Study Group. **Prevalence and Outcomes of Hepatitis B Co-infection and Associated Liver Disease among ART-naïve Individuals in a Rural Tanzanian HIV cohort.** Open Forum Infectious Diseases, 07/ 2016

12. Gamell A, Glass TR, Luwanda LB, Mapesi H, Samson L, Mtoi T, Nyamtema A, Muri L, Ntamatungiro A, Tanner M, Hatz C, Battegay M, Letang E; KIULARCO Study Group. **An Integrated and Comprehensive Service Delivery Model to Improve Pediatric and Maternal HIV Care in Rural Africa**. J Acquir Immune DeficSyndr. 2016 Sep 1.

13. Mapesi H, Ramírez A, Tanner M, Hatz C, Letang E; KIULARCO Study Group. **Immune reconstitution inflammatory syndrome associated with dermatophytoses in two HIV-1 positive patients in rural Tanzania: a case report**. BMC Infect Dis. 2016 Sep 20;16:495.

14. Sikalengo G, Ramirez A, Faini D, Mwamelo K, Battegay M, Jugheli L, Hatz C, Reither K, Letang E. **Tuberculous spondylitis diagnosed through Xpert MTB/RIF assay in urine: a case report**. BMC Infect Dis. 2016; 16(1):514

15. Muri L, Gamell A, Ntamatungiro AJ, Glass TR, Luwanda LB, Battegay M, Furrer H, Hatz C, Tanner M, Felger I, Klimkait T, Letang E; KIULARCO Study Group.. Development of HIV drug resistance and therapeutic failure in children and

adolescents in rural tanzania - an emerging public health concern. AIDS. 2016 Sep [ePub ahead of print]

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17. Rodríguez-Arbolí E, Mwamelo K, Kalinjuma AV, Furrer H, Hatz C, Tanner M, Battegay M, Letang E; KIULARCO Study Group. **Incidence and risk factors for hypertension among HIV patients in rural Tanzania - A prospective cohort study.** PLoS One. 2017 Mar 8;12(3):e0172089.

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21. Letang E, Kalinjuma AV, Glass TR, Gamell A, Mapesi H, Sikalengo GR, Luwanda LB, Mnzava D, Ntamatungiro AJ, Ndaki R, Francis G, Vanobberghen F, Furrer H, Klimkait T, Felger I, Tanner M, Hatz C, Weisser M, Battegay M, Kiularco Study Group. Cohort profile: **The Kilombero and Ulanga Antiretroviral Cohort (KIULARCO) - A prospective HIV cohort in rural Tanzania**. Swiss Med Wkly. 2017 Jul 11;147:w14485.

22. Gamell A, Luwanda LB, Kalinjuma AV, Samson L, Ntamatungiro AJ, Weisser M,Gingo W, Tanner M, Hatz C, Letang E, Battegay M; KIULARCO Study Group. **Prevention of mother-to-child transmission of HIV Option B+ cascade in rural Tanzania: The One Stop Clinic model.**PLoS One. 2017 Jul 12;12(7):e0181096.

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