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HIV and treatment Outcomes among adolescents in a rural Tanzanian Cohort

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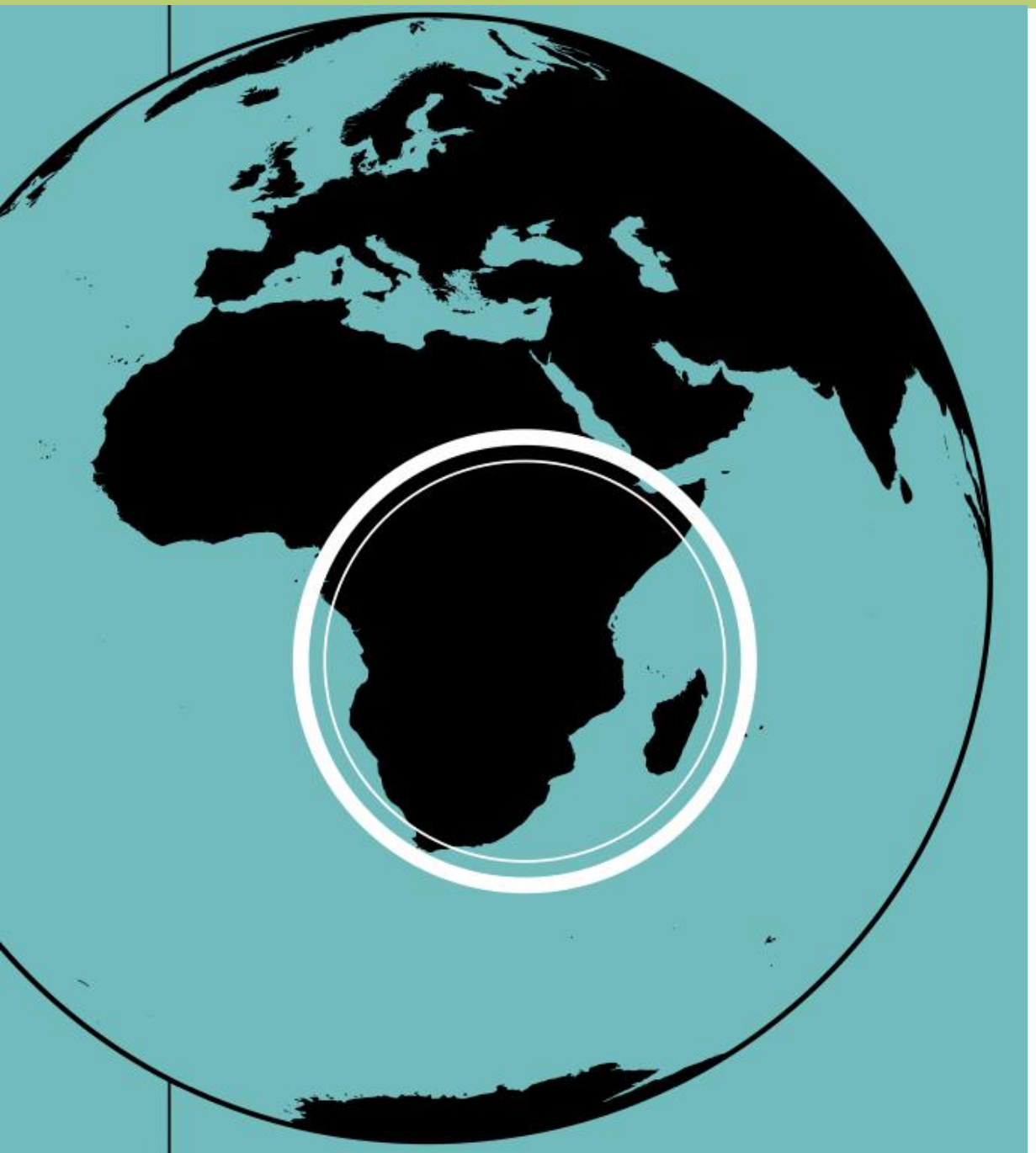
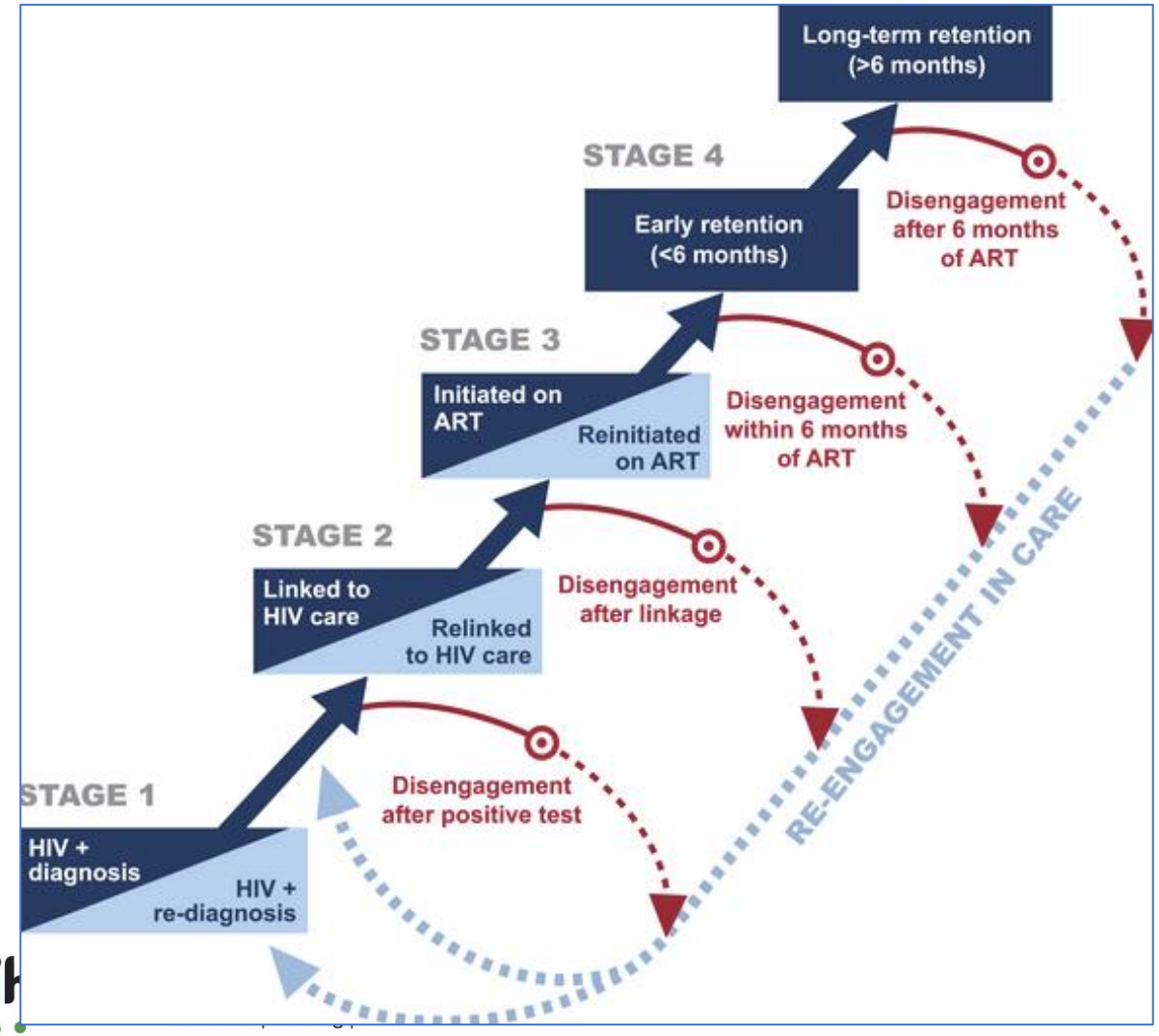
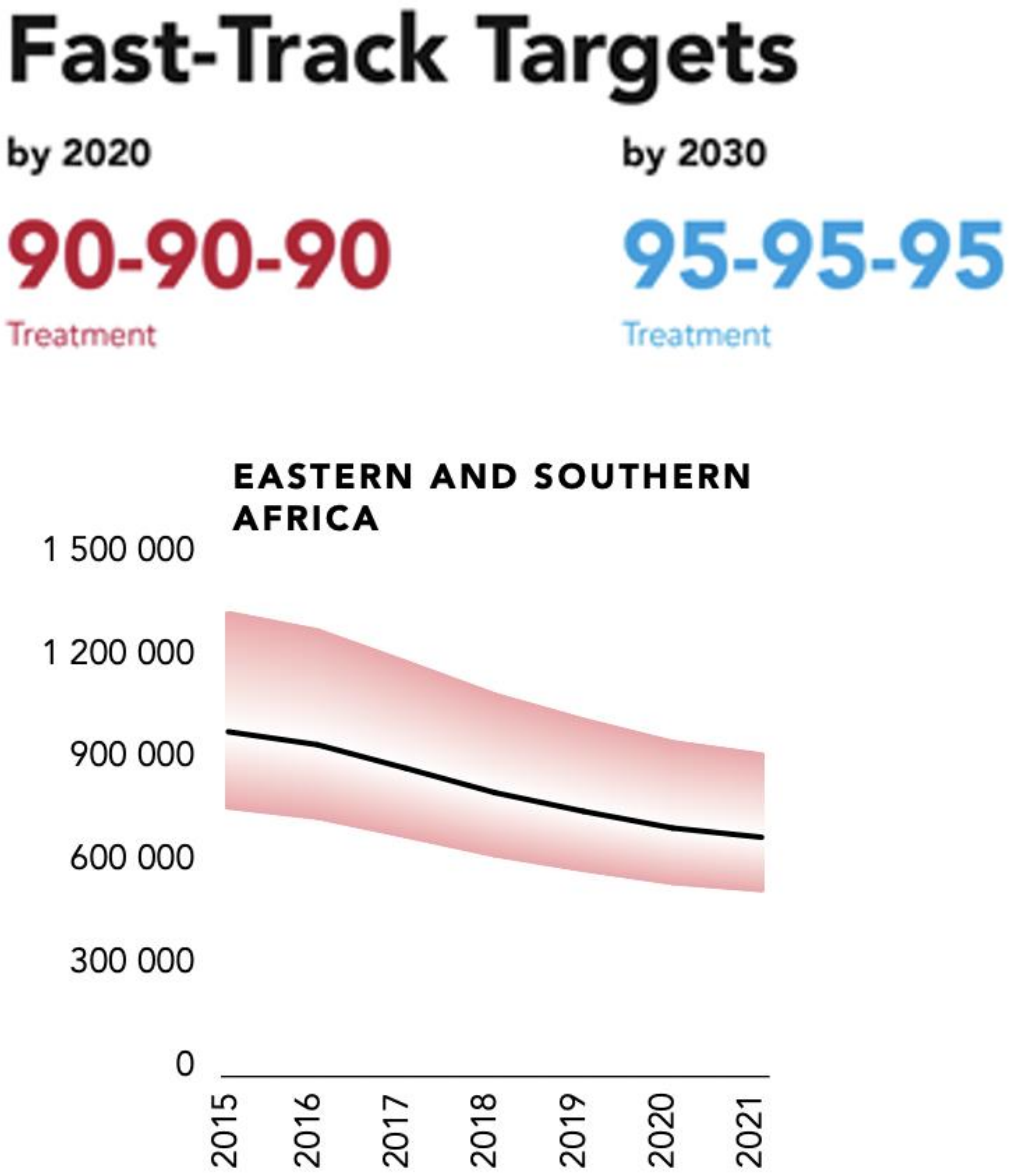


HIV IN SSA

- SSA is the region most affected by HIV
- 86% of the global population of adolescents living with HIV reside in SSA
- The global goal is to end AIDS as a pandemic by 2030, for all age groups

HIV care cascade





HIV treatment Outcomes among adolescents in a rural Tanzanian Cohort

The KIULARCO cohort

KIULARCO COHORT

- **Ki**lombero and **Ul**anga **A**nti-**R**etroviral **Co**hort

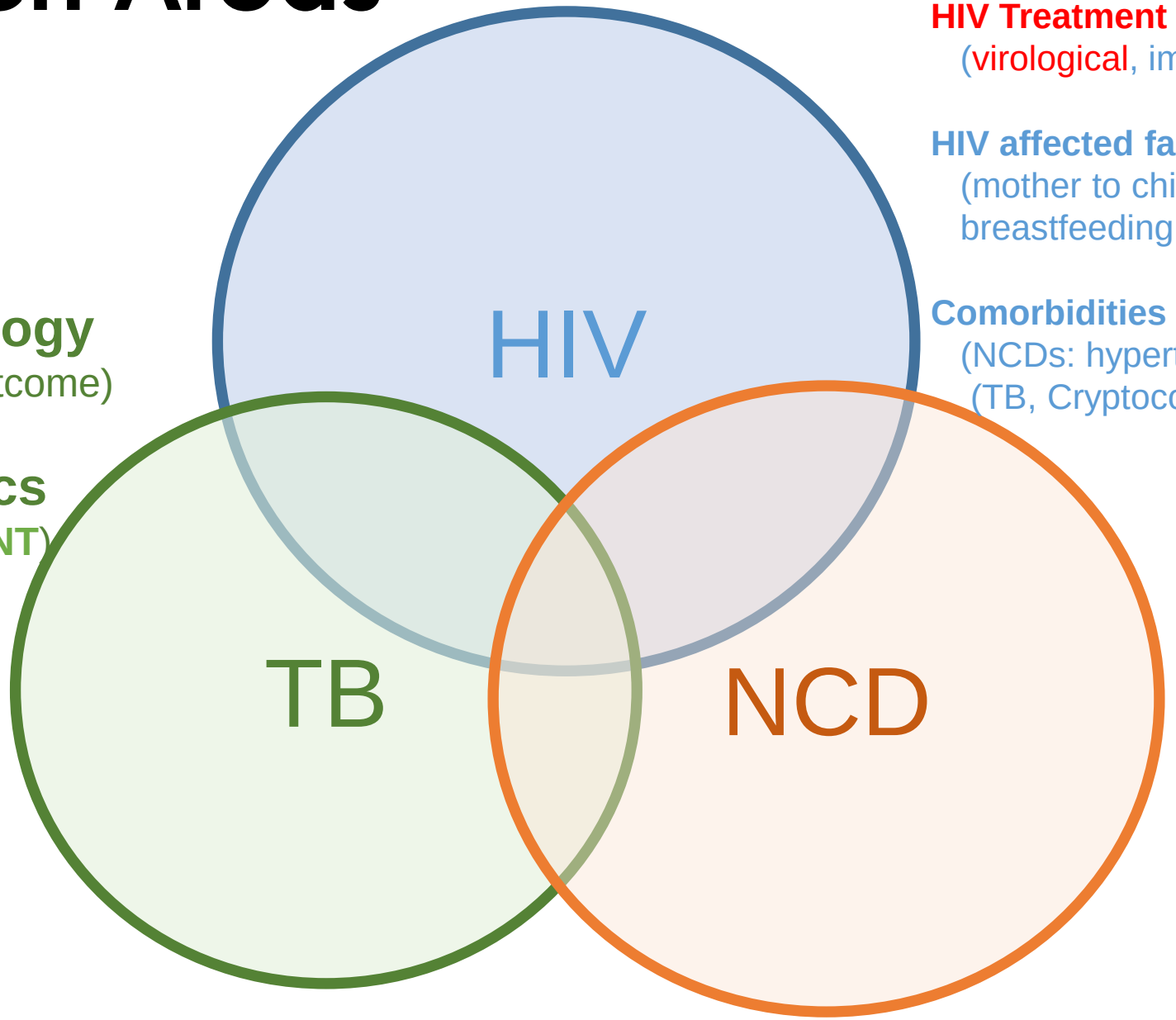
- Based at the Chronic Disease Clinic of Ifakara (CDCI) at the St. Francis hospital

- CDCI was established in 2004

- KIULARCO cohort was established in 2005

- Enrol consenting individuals living with HIV living in/around the Kilombero valley

Research Areas



HIV Treatment outcome
(virological, immunological & clinical outcomes)

HIV affected families
(mother to child transmission, HIV in pregnancy/ breastfeeding, HIV in children and adolescents)

Comorbidities
(NCDs: hypertension, kidney failure…)
(TB, Cryptococcal infection)

TB Epidemiology
(presentation, outcome)

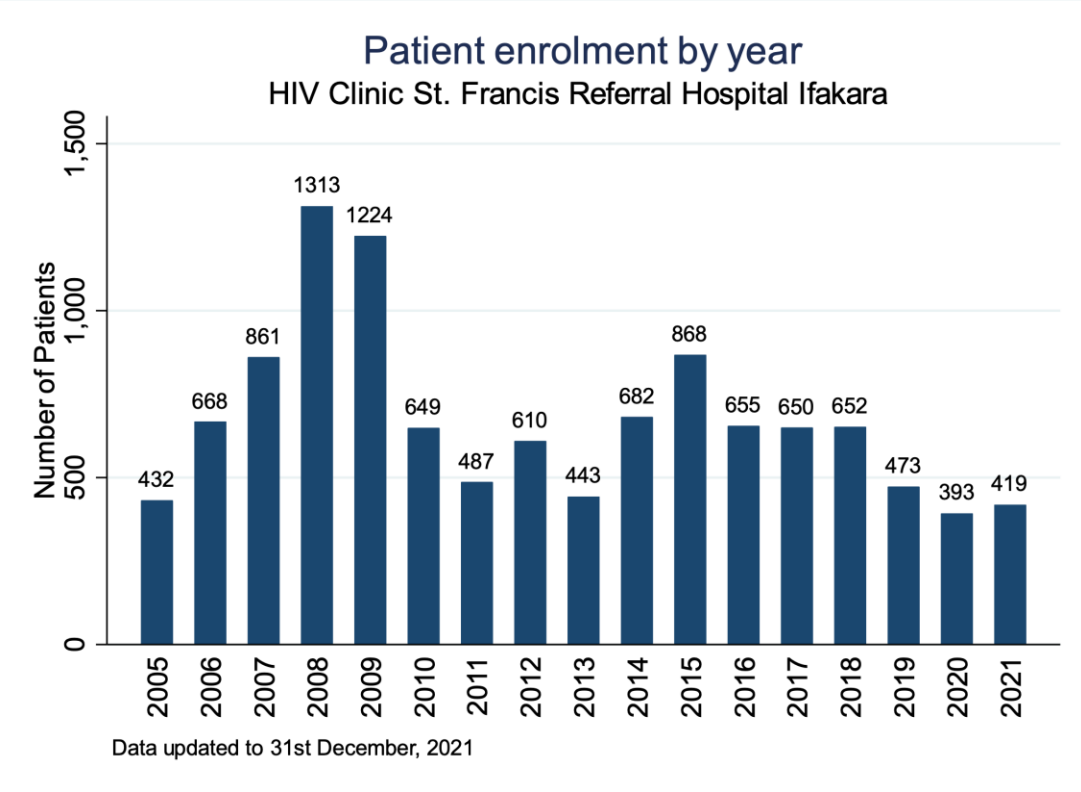
TB Diagnostics
(FASH, **EXULTANT**)

Cardiac disesases
(hypertensive heart failure, postpartum cardiomyopathy)

Lung diseases
Lung Sonography
TB sequelae, COPD)

KIULARCO cohort

Characteristics	Cumulative 2005-2021
Newly enrolled patients¶	419
Total enrolled patients	12'203
On active follow-up	4'161
Died	1'155
Lost to follow-up	4'999
Transfer out	1'888
Age at enrolment	
0 - 15	1'107
16 - 49	9'324
50 and Above	1'742
Pregnancy status at enrolment	
No	7'195
Yes	504
ART information	
Started ART	7'940
Started ART in other clinics	1'588
Never started ART	1'951
All enrolled patients	
Follow-up visits*	
Cumulative number of visits	252'791
Patients on ART and on active follow-up**	4'048



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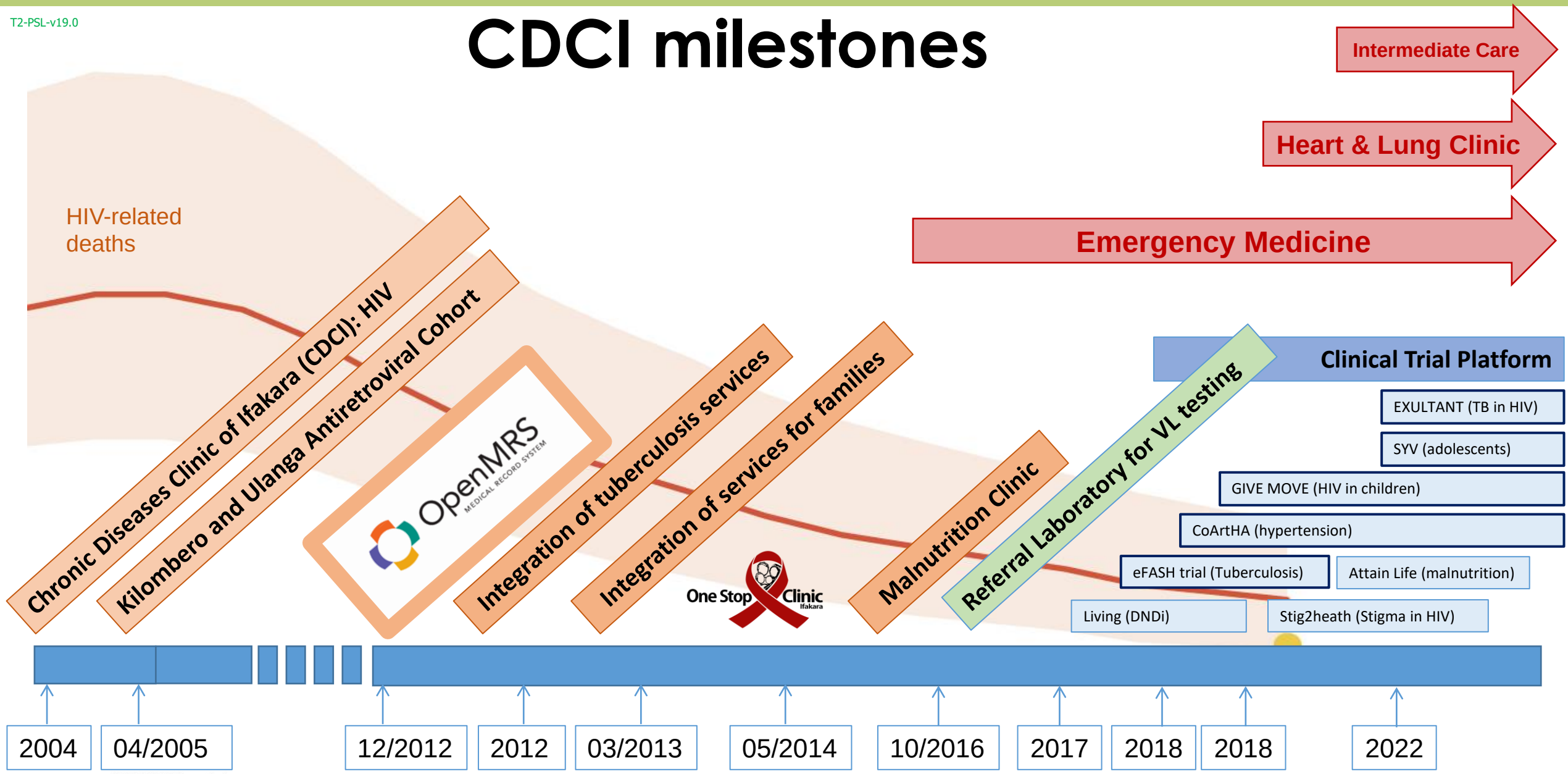
CDCI milestones



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HIV treatment Outcomes among adolescents in a rural Tanzanian Cohort

Introduction

- Over 80% of adolescents living with HIV reside in SSA
- The decline of HIV related deaths and new infections among adolescents is slower than that of other populations
- Adolescents have poorer treatment outcomes

Objectives: To assess viral suppression, adherence and associated factors among adolescents aged 10-19 years enrolled KIULARCO cohort after implementation of routine VL

Methods

- **Design** – Cross-sectional study nested within KIULARCO
- **Site** – CDCI –Ifakara
- **Inclusion criteria**

  -On ART for at least 6 months at the time point of their first routine VL assessment

  - With a clinical visit recorded in the data base

- A HVL ≥1000 copies/ml was categorised as unsuppressed
- Adherence was assessed by VAS, self adherence and pill count

Results

Figure 1: Flow chart of adolescents in KIULARCO cohort

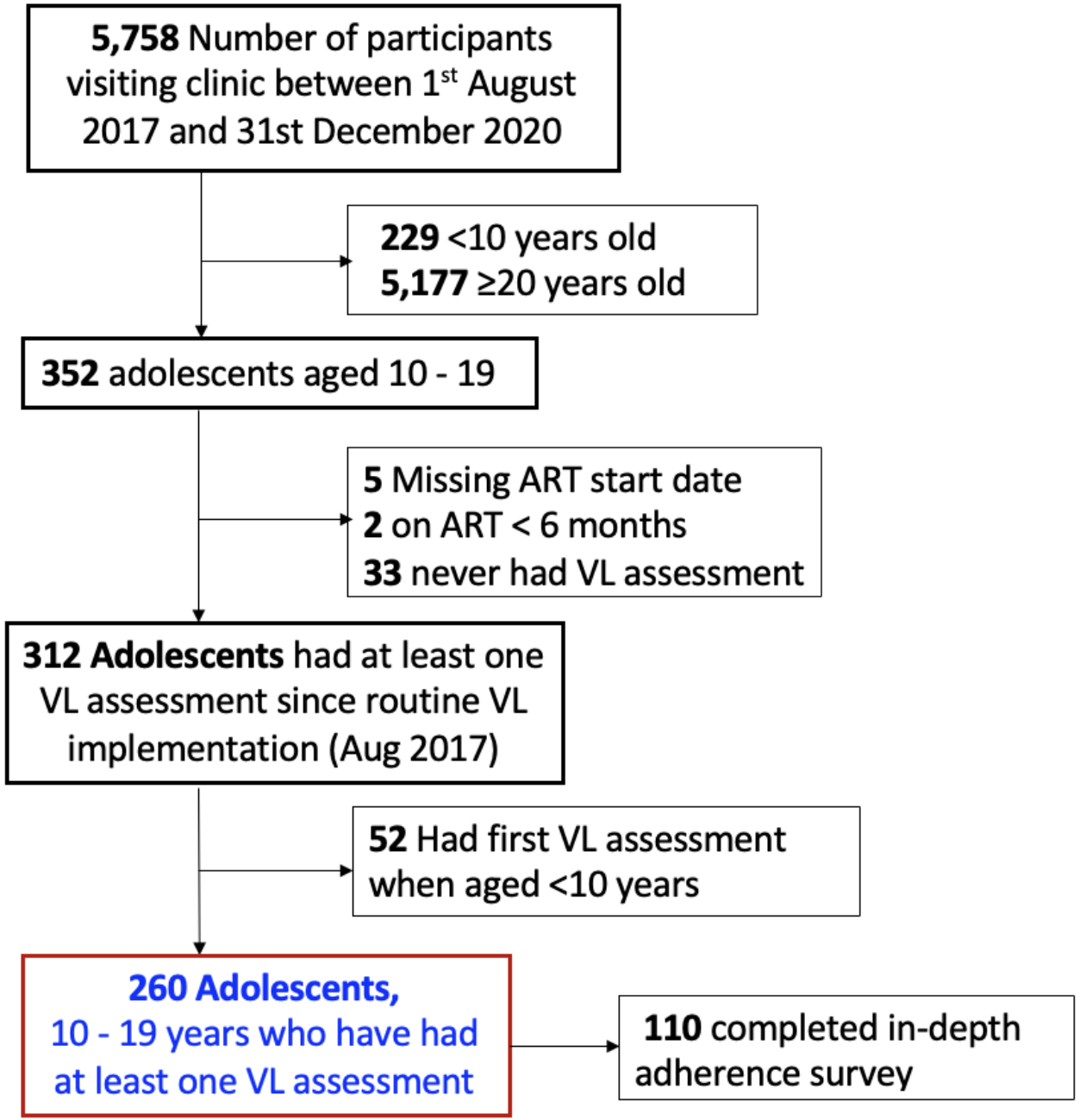

Table 1: Characteristics of study participants

Characteristics	ALL (N=260)	Suppressed (<1000 copies/ml) 200 (77%)	Unsuppressed (≥1000 copies/ml) 60 (23%)
Sex, n (%)			
Male	136 (52%)	109 (55%)	27 (45%)
Female	124 (48%)	91 (45%)	33 (55%)
Age in years, n (%)			
10-13	111 (43%)	87 (44%)	24 (40%)
14-16	76 (29%)	59 (30%)	17 (28%)
17-19	73 (28%)	54 (27%)	19 (32%)
Years since ART initiation, n (%)			
6 months-2	103 (39%)	76 (39%)	27 (45%)
3-6	74 (29%)	56 (28%)	18 (30%)
6-12	83 (32%)	68 (34%)	15 (25%)
Education status, n (%)			
None	37 (14%)	30 (15%)	7 (12%)
Primary	194 (75%)	153 (77%)	41 (68%)
Secondary	29 (11%)	17 (9%)	12 (20%)
Disclosed HIV status, n (%)			
No	57 (26%)	50 (29%)	7 (13%)
Yes	166 (74%)	120 (71%)	46 (87%)
Missing	37 (14%)	30 (15%)	7 (12%)
Presumed mode of infection, n (%)			
Perinatal	81 (61%)	59 (61%)	22 (61%)
Heterosexual	23 (17%)	16 (17%)	7 (19%)
Unknown/other	29 (22%)	22 (23%)	7 (19%)
Missing	127 (49%)	103 (52%)	24 (40%)
Distance of residence from clinic, n (%)			
<=1 km	108 (43%)	87 (45%)	21 (36%)
2 - <50 km	88 (35%)	68 (35%)	20 (34%)
≥50 km	58 (23%)	40 (21%)	18 (31%)
Missing	6 (2%)	5(3%)	1 (2%)
HIV WHO stage, n (%)[a]			
I & II	105 (43%)	80 (43%)	25 (42%)
III & IV	140 (57%)	106 (57%)	34 (58%)
Missing	15 (6%)	14 (7%)	1 (2%)
CD4 count cells/mm^3 [a]			
< 500	79 (32%)	45 (24%)	34 (59%)
500-999	122 (49%)	101 (53%)	21 (36%)
≥ 1000	46 (19%)	43 (23%)	3 (5%)
Missing	13 (5%)	11 (6%)	2 (3%)
ART regimen type, n (%)			
NNRTI based	195 (75%)	149 (75%)	46 (77%)
PI based	54 (21%)	42 (21%)	12 (20%)
DTG	11 (4%)	9 (5%)	2 (3%)
Any suspected treatment failure, n (%)			
No	240 (98%)	187 (100%)	53 (90%)
Yes	6 (2%)	0 (0%)	6 (10%)
Missing	14 (5%)	13 (7%)	1 (2%)

Results are number and percent of those with non-missing data, missing data rows are number and column %.

[a]HIV WHO stage and CD4 measurement closest to baseline within 6 months before and 3 months after

There was a **weak to moderate** agreement between the adherence measures and VL suppression

Table 1: Agreement between adherence to ART and viral load

Adherence to ART	Viral Load			
	Suppressed (<1000 copies/ml) N (%)	Unsuppressed (=>1000 copies/ml) N (%)	Total	Percent agreement (Kappa)
Overall	200 (77%)	60 (23%)	260 (100%)	
Self-reported in the past 4 weeks				76% (0.10)
Never missed a dose	186 (79%)	50 (21%)	236 (100%)	
Missed at least one dose	14 (58%)	10 (42%)	24 (100%)	
Pill Box return				58% (0.002)
Yes	134 (78%)	39 (22%)	173 (100%)	
No	66 (76%)	21 (24%)	87 (100%)	
Visual Analog Scale[a]				62% (0.09)
Optimal (≥90%)	58 (80%)	13 (18%)	71 (100%)	
Sup Optimal (<90%)	30 (77%)	9 (24%)	39 (100%)	

[a]110 participants completed an in-depth adherence support questionnaire for Visual Analog Scale.

Factors associated with viral suppression

- Being male
- Higher CD4 count
- Self report of ”never missed ART” in the past four weeks
- Not disclosed the HIV status

Table 2: The relationship between participant characteristics and suppressed viral load among HIV-infected adolescents

Characteristics	ALL (N=260)	Suppressed (<1000 copies/ml) (N=200), N%	Unsuppressed (≥1000 copies/ml) (N=60), N%	Adjusted OR [95% CI][bc]	P-value [bc]
Sex					
Male	136 (52%)	109 (55%)	27 (45%)	Ref	
Female	124 (48%)	91 (45%)	33 (55%)	0.44 [0.20, 0.99]	0.05
Age in years					
10-13	111 (43%)	87 (44%)	24 (40%)	Ref	
14-16	76 (29%)	59 (30%)	17 (28%)	1.17 [0.43, 3.21]	0.92
17-19	73 (28%)	54 (27%)	19 (32%)	1.22 [0.43, 3.49]	
Years since ART initiation					
6 months-2	103 (39%)	76 (39%)	27 (45%)	Ref	
3-6	74 (29%)	56 (28%)	18 (30%)	0.83 [0.31, 2.23]	0.89
6-12	83 (32%)	68 (34%)	15 (25%)	0.78 [0.25, 2.41]	
Education status					
None	37 (14%)	30 (15%)	7 (12%)	Ref	
Primary	194 (75%)	153 (77%)	41 (68%)	1.55 [0.40, 6.03]	0.19
Secondary	29 (11%)	17 (9%)	12 (20%)	0.51 [0.08, 3.20]	
Disclosed HIV status					
No	57 (26%)	50 (29%)	7 (13%)	Ref	0.06
Yes	166 (74%)	120 (71%)	46 (87%)	0.38 [0.14, 1.06]	
Distance of residence from clinic					
<=1 km	108 (43%)	87 (45%)	21 (36%)	Ref	0.19
2 - <50 km	88 (35%)	68 (35%)	20 (34%)	0.49 [0.19, 1.27]	
≥50 km	58 (23%)	40 (21%)	18 (31%)	0.42 [0.15, 1.18]	
HIV WHO stage[a]					
I & II	105 (43%)	80 (43%)	25 (42%)	Ref	0.90
III & IV	140 (57%)	106 (57%)	34 (58%)	1.05 [0.47, 2.35]	
CD4 count cells/mm^3 [a]					
< 500	79 (32%)	45 (24%)	34 (59%)	Ref	
500-999	122 (49%)	101 (53%)	21 (36%)	5.09 [2.16, 12.0]	<0.001
≥ 1000	46 (19%)	43 (23%)	3 (5%)	17.0 [3.56, 81.1]	
ART regimen type					
NNRTI based	195 (75%)	149 (75%)	46 (77%)	Ref	
PI based	54 (21%)	42 (21%)	12 (20%)	2.12 [0.62, 7.22]	0.37
DTG	11 (4%)	9 (5%)	2 (3%)	2.65 [0.23, 30.2]	
Self-reported ART adherence in the past 4 weeks					
Missed at least one dose	24 (9%)	14 (7%)	10 (17%)	Ref	
Never missed dose	236 (91%)	186 (93%)	50 (83%)	5.78 [1.87, 17.8]	0.002

Lessons

- Viral suppression among adolescents in this rural cohort is below the UNAIDS viral suppression goal
- Age-appropriate interventions to improve viral suppression among adolescents are of paramount importance.
- The weak to moderate association between adherence assessment and VL outcome indicate needs to strengthen adherence assessment.
- There is no one best fit adherence assessment methods.
- Self-adherence report should be used in combination with other adherence methods such as VAS and pill box return.

AGE OF CONSENT FOR HIV TESTING IN SSA

- Age of consent ranges between 12- 18 years
- All countries have explicitly defined age of consent
- Scarce evidence suggest higher uptake of HIV testing among adolescents in setting of lower age of consent

Table 1: Age of consent by number of countries

Age of consent (years)	Number of countries in 2013	Number of countries in 2019
12 - 14	5	14
15 - 17	8	9
18	12	10
NA	2	0
ND	6	0
Total	**33**	**33**


THANK YOU.