Prevalence of SARS-CoV-2 among Persons on HIV Antiretroviral Treatment in Mozambique: Baseline Characteristics among Participants of the COVIV Cohort Study

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Background

- The COVID-19 epidemic in Mozambique accounted for a cumulative number of cases of 233,334 (April 12, 2023), undergoing four waves since March 2020.
- The impact of the COVID-19 epidemic among people living with HIV (PLHIV) has not been thoroughly investigated in Mozambique.
- The COVIV ("**COV**ID/H**IV**") cohort study, implemented in four provinces over two years, aims to investigate prevalence and incidence of SARS-CoV-2 among PLHIV in care and health care workers (HCW) (**Figure 1**).
- The present analysis describes the baseline characteristics of the subgroup of enrolled PLHIV in three provinces.

Figure 1. Locations of the COVIV study (Dark blue: recruitment PLHIV and HCW; Light Blue: recruitment HCW only).

Methods

- Participants (PLHIV) were recruited at three health facilities in Maputo City, Inhambane and Zambézia Provinces.
- All were screened at baseline for COVID-19 risk, using a standardized risk assessment questionnaire, and for SARS-CoV-2 antibodies, using Abbott™ IgM/IgG antibody rapid test (AB-RT). Those with either positive risk assessment or AB-RT underwent SARS-CoV-2 PCR testing.
- Participants were enrolled in one of the following arms, depending on the presence of active infection/exposure, irrespectively of COVID-19 vaccination status:
  1. Not-actively-infected/not-exposed (AB-RT *and* PCR negative) (Arm 1);
  2. Active COVID-19 infection (PCR positive) (Arm 2);
  3. Not-actively-infected/exposed (AB-RT positive *and* PCR negative) (Arm 3).

Results

- A total of 1286 PLHIV were recruited from June 2021 to April 2022; 65% female; median age 40 years (IQR 32-49) (**Table 1**).
- 410 (32%) tested positive for SARS-CoV-2 IgG/IgM (**Table 1**).
- 777 (60.4%) underwent PCR testing based on risk assessment/AB-RT. Among those with PCR testing, 64 (8.2%) had a positive result, with most active infections (53 [82.8%]) identified in Maputo (**Table 1**).
- Of all identified active infections, 54 (84.4%) occurred between June-August 2021, 6 (9.4%) in December 2021-January 2022 (**Figure 2**).
- The 1286 participants were allocated to three arms, according to the results of the AB-RT and/or PCR (**Figure 3**).
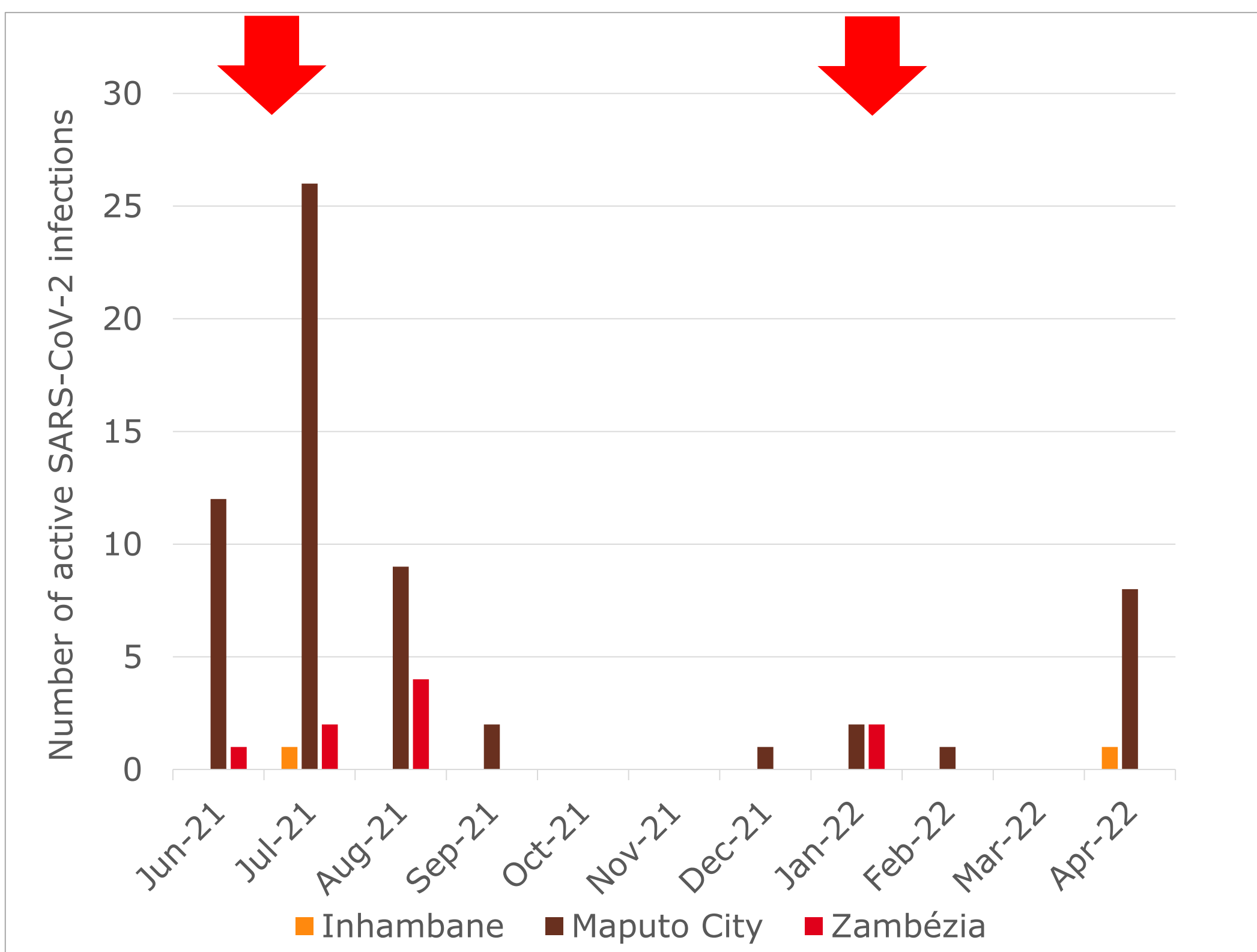
Figure 2. Active SARS-CoV-2 infections, per month and per study location. Red arrows reflects timing of 3rd and 4th COVID-19 waves in Mozambique.
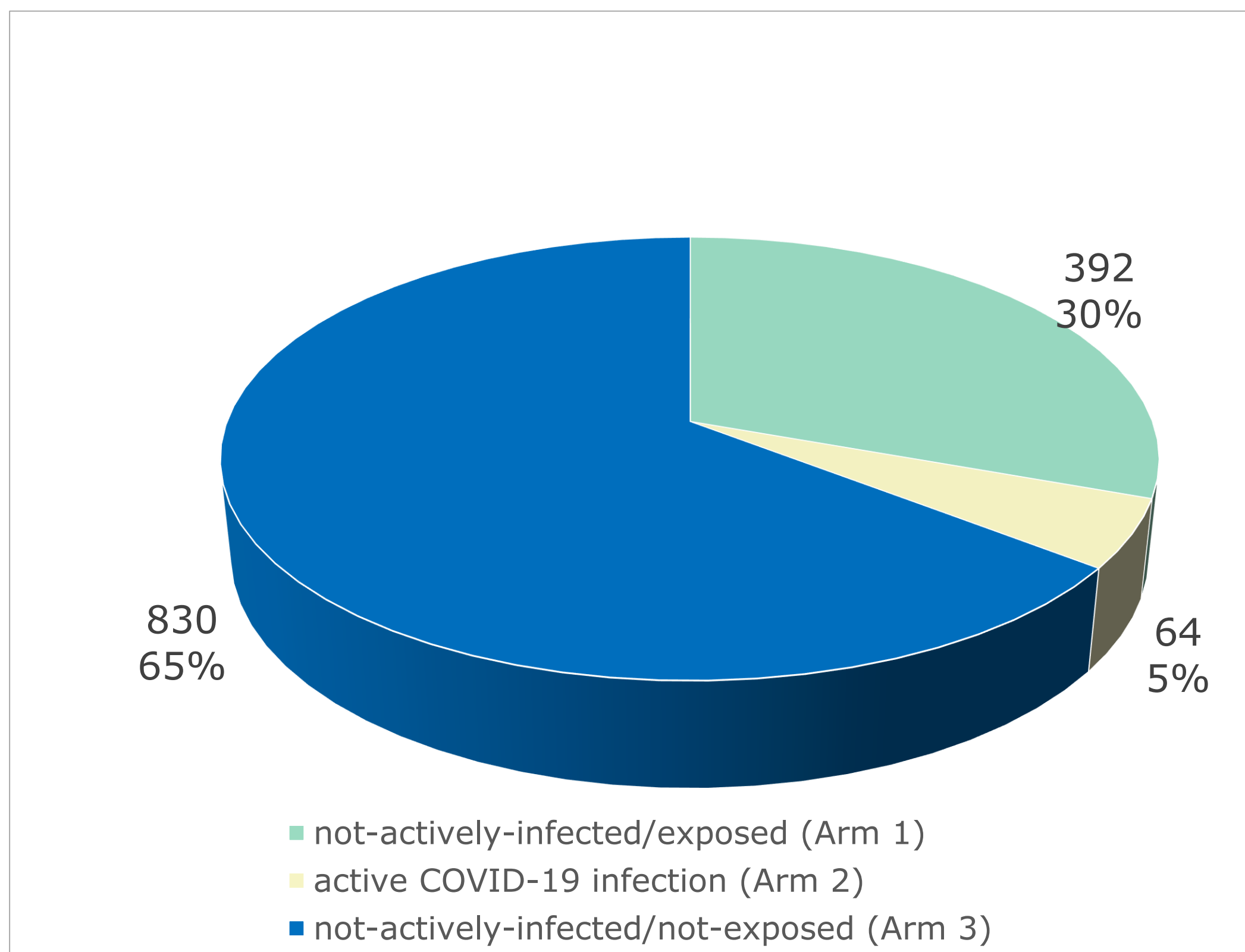
Figure 3. Allocation to different arms at enrolment visit.

Table 1. Sociodemographic and HIV- and SARS-CoV-2-related characteristics, per study location

	Total (n=1286)	Inhambane (n=296)	Maputo City (n=637)	Zambézia (n=353)	P-value[1]
Sociodemographics					
Age, years (median, IQR)	40 (32-49)	42 (35-51)	39 (30-48)	40 (33-50)	
Sex (n, %)					<0.01
Female	840 (65.32%)	215 (72.64)	427 (67.03)	198 (56.09)	
Male	446 (34.68%)	81 (27.36)	210 (32.97)	155 (43.91)	
Educational level (n, %)					<0.01
Never went to school	102 (7.93)	43 (14.53)	29 (4.55)	30 (8.5)	
Alphabetization	463 (36)	97 (32.77)	249 (39.09)	117 (33.14)	
Primary (7th grade completed)	503 (39.11)	95 (32.09)	278 (43.64)	130 (36.83)	
Secondary (12th grade completed)	175 (13.61)	51 (17.23)	70 (10.99)	54 (15.3)	
Superior/ University	43 (3.34)	10 (3.38)	11 (1.73)	22 (6.23)	
Civil Status (n, %)					<0.01
Married/ Living together	763 (59.33)	155 (52.36)	380 (59.65)	228 (64.59)	
Divorced	175 (13.61)	36 (12.16)	94 (14.76)	45 (12.75)	
Single	191 (14.85)	75 (25.34)	94 (14.76)	22 (6.23)	
Widowed	157 (12.21)	30 (10.14)	69 (10.83)	58 (16.43)	
HIV					
WHO staging (n, %)					<0.01
I	857 (66.64)	157 (53.04)	445 (69.86)	255 (72.24)	
II	228 (17.73)	101 (34.12)	76 (11.93)	51 (14.45)	
III	175 (13.61)	33 (11.15)	98 (15.38)	44 (12.46)	
IV	26 (2.02)	5 (1.69)	18 (2.83)	3 (0.85)	
TB history (self-reported) (n, %)					<0.01
No	1206 (93.78)	288 (97.30)	571 (89.64)	347 (98.3)	
Yes	80 (6.22)	8 (2.7)	66 (10.36)	6 (1.7)	
Median time on ART (median, IQR) [n=1270]	5.3 (2.8-8.7)	4.8 (2.7-9.0)	5.4 (2.7-9.2)	5.7 (3.0-8.1)	0.63
CD4+ T-cell count at study enrolment, cells/mm³ (median, IQR) [n=1267]	506 (367-670)	508 (345-682)	531 (394-681)	475 (345-645)	<0.01
Viral load in the last 12 months[2] (n, %) [n=1076]					<0.01
Suppressed	928 (86.25)	241 (92.34)	429 (79.89)	258 (92.81)	
Not Suppressed	148 (13.75)	20 (7.66)	108 (20.11)	20 (7.19)	
SARS COV-2					
Risk evaluation (n, %)					<0.01
Negative	625 (48.6)	281 (94.93)	131 (20.57)	213 (60.34)	
Positive	661 (51.4)	15 (5.07)	506 (79.43)	140 (39.66)	
AB-RT COVID-19 (n, %)					<0.01
IgM Neg / IgG Neg	875 (68.04)	207 (69.93)	489 (76.77)	179 (50.71)	
IgM Neg / IgG Pos	341 (26.52)	81 (27.36)	96 (15.07)	164 (46.46)	
IgM Pos / IgG Neg	13 (1.01)	5 (1.69)	1 (0.16)	7 (1.98)	
IgM Pos / IgG Pos	57 (4.43)	3 (1.01)	51 (8.01)	3 (0.85)	
SARS CoV-2 PCR (n, %) [n=777]					0.05
Negative	713 (91.76)	26 (92.86)	486 (90.17)	201 (95.71)	
Positive	64 (8.24)	2 (7.14)	53 (9.83)	9 (4.29)	

[1]Chi-square (categorical), Kruskal Wallis (continuous); [2]Viral suppression: <1000 copies/ml

Conclusions

- About one in three PLHIV in this cohort were found to be exposed to SARS-CoV-2; one in 20 were confirmed actively infected with SARS-CoV-2, consistent with timing of COVID-19 epidemic waves in Mozambique.
- Follow-up of active infection is important to monitor clinical, immunological and virologic HIV-related short and mid-term outcomes.

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