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TIME OF TREATMENT INITIATION IN PEOPLE LIVING WITH HIV

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BACKGROUND

The current HIV epidemics scenario leads to a need for a new model of care in order to offer proper assistance for people living with HIV (PLWHIV). In this context, primary health care (PHC) is an essential service that can provide the conditions to perform this task. This study aims to compare the time for antiretroviral therapy (ART) initiation according to different types of health facilities (primary, specialized health care and hospital).

MATERIALS AND METHODS

We correlated socio-demographic and clinical factors with the time between first viral load (VL) and/or CD4 count at linkage to care and time for ART initiation. Survival functions were described by Kaplan-Meier and tested by log-rank. The Cox model was used to assess the influence of time on the significant variables and to estimate hazard. We used R 2.7 in the statistical analysis and AIC test to determine the best model.

RESULTS

A total of 6,963 PLWHIV were included in the study. Overall, 4,788 (68,8%) were male; 3,378 (48,5%) were aged between 25-39 years; 4,242 (60%) presented VL $\geq 10,000$ copies/mL; 2,698 (38,7%) presented CD4 count ≥ 500 cells/mm³. 3,203 (46%) were assisted in primary health care. Earlier ART initiation was observed among male patients (84 days, 95%CI=79-82, compared to 108 days, 95%CI= 93-123 for female); those presenting VL $\geq 10,000$ copies/mL (60 days, 95%CI= 57-64); CD4 count < 200 cells/mm³ (52 days, 95%CI=48-57); and those assisted in PHC (78 days, 95%CI 95%= 74-84 compared to hospital: 132 days, 95%CI= 96-178). Adjusted hazard ratio identified "gender" and "age group" as non-significant variables, and "VL" (VL $\geq 10,000$, HR=6.3047, 95%CI= 5.3230-7.4674) and "CD4" (CD4 0-199, HR=0.8679, 95%CI= 0.8029-0.9381) as the most significant clinical factors associated to earlier ART initiation.

Table 1 - Distribution of PLWHIV aged 18+, according to sociodemographic and clinical characteristics and the complexity level of the service of the first LT-CD4+ and/or VL-HIV request. Municipality of Rio de Janeiro/RJ, 2014 to 2016

COMPLEXITY LEVEL	N. OF PLWHIV	PRIMARY %	SPECIALIZED %	HOSPITAL %	NO DATA
Male	4788	47.9	11.7	16.7	23.8
Female	2175	41.8	10.1	16.5	17.5
AGE GROUP					
18-24 years	1462	42.8	10.5	2.5	21.7
25-39 years	3278	45.9	10.8	20.8	22.5
40-49 years	1203	45.3	11.9	17.3	22.5
50-59 years	670	45.9	12.8	18.1	19.3
60+	250	45.2	12.4	25.2	17.2
SCHOOLING					
0-7 years	796	54.9	7.9	18.7	18.5
8-11 years	648	51.2	10.8	19.6	18.4
12+ years	707	46.1	10.6	22.8	18.5
No data	4612	43.2	11.9	21.4	23.5
RACE/COLOR					
White	1485	47.3	11.4	20.4	20.9
Black	722	52.6	8.4	21.5	17.5
Yellow	39	50	10.3	17.9	12.8
Mixed	1326	50.7	10.8	20.9	17.6
Indigenous	7	57.1	14.3	14.3	14.3
No data	42	42	11.8	21.2	24.9
VL AT ART INITIATION					
0-49	721	35.9	13.3	27.7	23
50-199	436	44.9	8	21.8	25.3
200-999	436	38.1	9.2	26.1	26.6
1000-9999	1339	46.4	11.2	22.2	20.2
10000+	4242	48.5	13.2	18.9	21.4
CD4 AT ART INITIATION					
0-199	1684	45.8	10.3	22.3	21.6
200-349	1240	46.2	10.9	20.7	22.3
350-499	1341	46.2	11.7	22.1	19.9
500+	2998	45.9	11.7	19.7	22.7
YEAR OF THE FIRST CD4 OR VL REQUEST					
2014	2237	41.6	15.1	23.2	20.1
2015	2148	43.9	10.8	21.8	23.5
2016	2278	52.6	7.8	18	21.7

Table 2 - Median time between the first LT-CD4+ and/or VL-HIV and the beginning of ART, according to selected variables, Rio de Janeiro 2014-2016

Variables	N. OF PLWHIV	% of PLWHIV	MEDIAN TIME (DAYS)	CI 95%	LOG-RANK P-VALUE
Total	6963	100	84	(79-82)	p<0.0001
SEX					
Male	4788	68.9	84	(79-82)	
Female	2175	31.1	108	(103-110)	
AGE GROUP					
18-24 years	1462	21	91	(77-106)	
25-39 years	3278	47.3	84	(77-92)	
40-49 years	1203	17.3	105	(88-130)	
50-59 years	670	9.6	102	(86-130)	
60+	250	3.6	131	(85-221)	
SCHOOLING					
0-7 years	796	11.4	74	(64-86)	
8-11 years	648	9.3	40	(34-48)	
12+ years	707	10.1	52	(44-57)	
No data	4612	66.2	103	(111-114)	
RACE/COLOR					
White	1485	21.3	99	(84-103)	
Black	722	10.4	65	(55-76)	
Yellow	39	0.6	52	(33-101)	
Mixed	1326	19	37	(33-44)	
Indigenous	7	0.1	27	(27-34)	
No data	3384	48.6	105	(104-107)	
VL-HIV AT ART INITIATION					
0-49	721	10.4	124	(84-163)	
50-199	229	3.2	87	(69-108)	
200-999	436	6.3	103	(79-142)	
1000-9999	1339	19.2	98	(84-113)	
10000+	4242	60.9	60	(57-64)	
LT-CD4+ AT ART INITIATION					
0-199	1684	24.2	52	(48-57)	
200-349	1240	17.8	68	(61-76)	
350-499	1341	19.3	84	(74-93)	
500+	2998	43.1	103	(100-108)	
YEAR OF THE FIRST LT-CD4+ OR VL-HIV REQUEST					
2014	2237	32.1	141	(126-161)	
2015	2148	30.7	109	(100-118)	
2016	2278	33.2	56	(51-61)	
COMPLEXITY LEVEL					
Primary	3203	46	78	(74-84)	
Specialized	779	11.2	111	(100-122)	
Hospital	1462	21	132	(106-178)	
No data	1519	21.8	130	(81-133)	

Table 3 - Factors associated with the median time to the ART initiation among PLWHIV who started treatment between 2014 and 2016 in the Municipality of Rio de Janeiro

Variables	Unadjusted Hazard Ratio	COX1		ADJUSTED HAZARD RATIO		COX2	
		REFERENCE	SUPERIOR	REFERENCE	SUPERIOR		
SEX							
Male	Ref	-	-	-	-	-	-
Female	0.8776	0.8053	0.8036	-	-	-	-
AGE GROUP							
18-24 years	Ref	-	-	-	-	-	-
25-39 years	1.0875	0.9707	1.063	-	-	-	-
40-49 years	0.8738	0.7968	0.9563	-	-	-	-
50-59 years	0.8979	0.7785	0.9752	-	-	-	-
60+	0.7947	0.6762	0.9487	-	-	-	-
SCHOOLING							
0-7 years	Ref	-	-	-	-	-	-
8-11 years	1.1507	1.0329	1.2674	1.0424	1.1877	1.2702	1.4112
12+	1.3047	1.1305	1.4933	1.2764	1.1187	1.4112	1.6102
No data	0.2862	0.6807	0.6275	1.1386	0.6205	1.2305	-
RACE/COLOR							
White	Ref	-	-	-	-	-	-
Black	0.6095	0.6026	1.0490	0.8345	0.8438	1.0349	-
Yellow	1.2675	0.8072	1.2642	1.1072	0.8284	1.0485	-
Mixed	1.0498	0.8466	1.0402	1.1036	0.9193	1.1362	-
Indigenous	1.0494	0.8486	1.0402	1.1036	0.9193	1.1362	-
No data	0.5502	0.5347	0.5490	0.8888	0.5395	0.6371	-
VL-HIV AT ART INITIATION							
0-49	Ref	-	-	-	-	-	-
50-199	2.059	2.027	2.376	1.4426	1.8006	2.3708	-
200-999	3.377	2.797	4.251	3.207	2.642	4.059	-
1000-9999	3.486	4.611	6.331	3.996	4.797	6.644	-
10000+	3.972	3.397	6.375	3.507	5.323	4.641	-
LT-CD4+ AT ART INITIATION							
0-199	Ref	-	-	-	-	-	-
200-349	0.8787	0.8406	1.0490	1.000	0.9496	1.0733	-
350-499	0.807	0.8335	0.8669	0.8662	0.8407	1.077	-
500+	0.8963	0.8486	0.8786	0.8786	0.8478	0.9086	-
YEAR OF THE FIRST LT-CD4+ OR VL-HIV REQUEST							
2014	Ref	-	-	-	-	-	-
2015	1.048	0.8768	1.175	1.0482	1.037	1.040	-
2016	1.17	1.0476	1.062	1.0461	1.0786	1.0588	-
COMPLEXITY LEVEL							
Primary	Ref	-	-	-	-	-	-
Specialized	0.8164	0.746	0.8979	0.868	0.8788	1.062	-
Hospital	0.7667	0.6207	0.764	0.6208	0.7064	0.6868	-
No data	0.8186	0.7088	0.8889	0.8404	0.8754	1.028	-

NOTE: THE VARIABLES "SEX" AND "AGE GROUP" WERE NOT SIGNIFICANT FOR THE COX MODEL, THEREFORE, THEY WERE NOT INCLUDED IN THE TABLE.

Figure 1 - Kaplan Meier curves of the median time for ART initiation among PLWHIV who started treatment, according to the HIV viral load value at the beginning of ART, between 2014 and 2016 in the Municipality of Rio de Janeiro

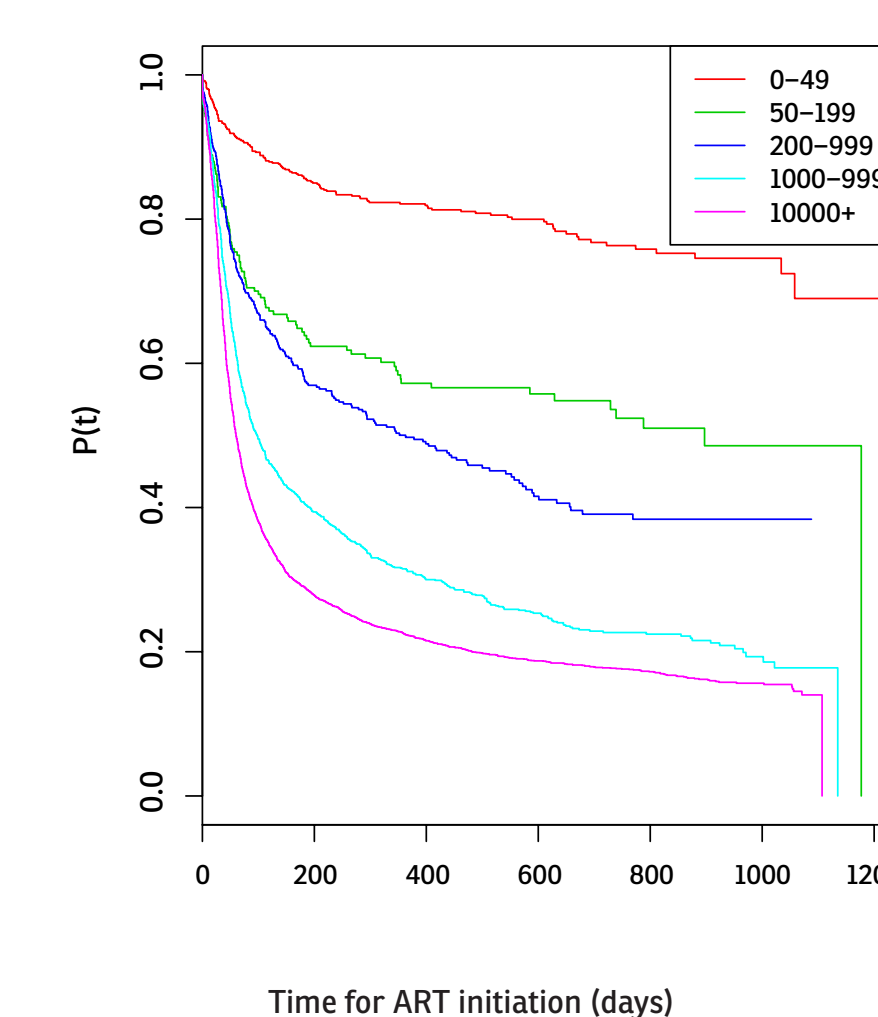


Figure 2 - Kaplan Meier curves of the median time for ART initiation among PLWHIV who started treatment, according to the LT-CD4+ value at the beginning of ART, between 2014 and 2016 in the Municipality of Rio de Janeiro

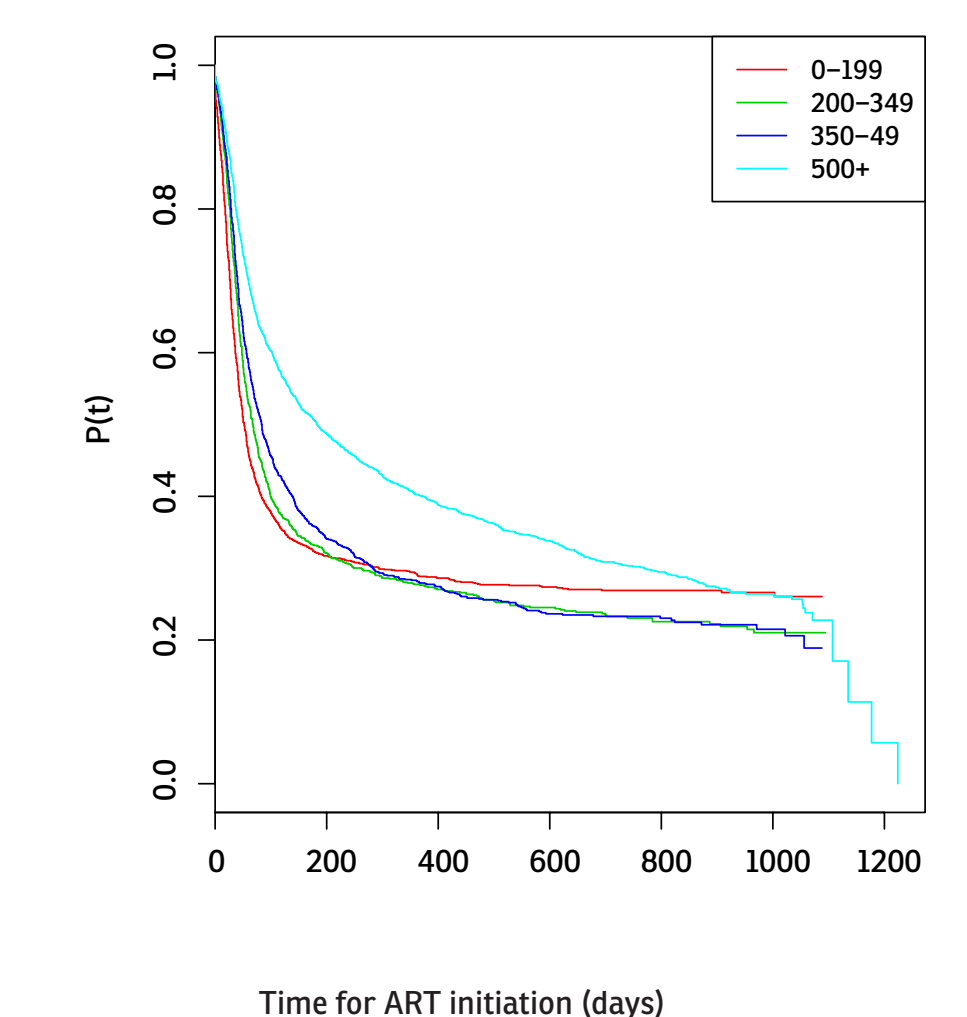


Figure 3 - Kaplan Meier curves of the median time for ART initiation among PLWHIV who started treatment, according to the year of the 1st CD4 or VL request, between 2014 and 2016 in the Municipality of Rio de Janeiro

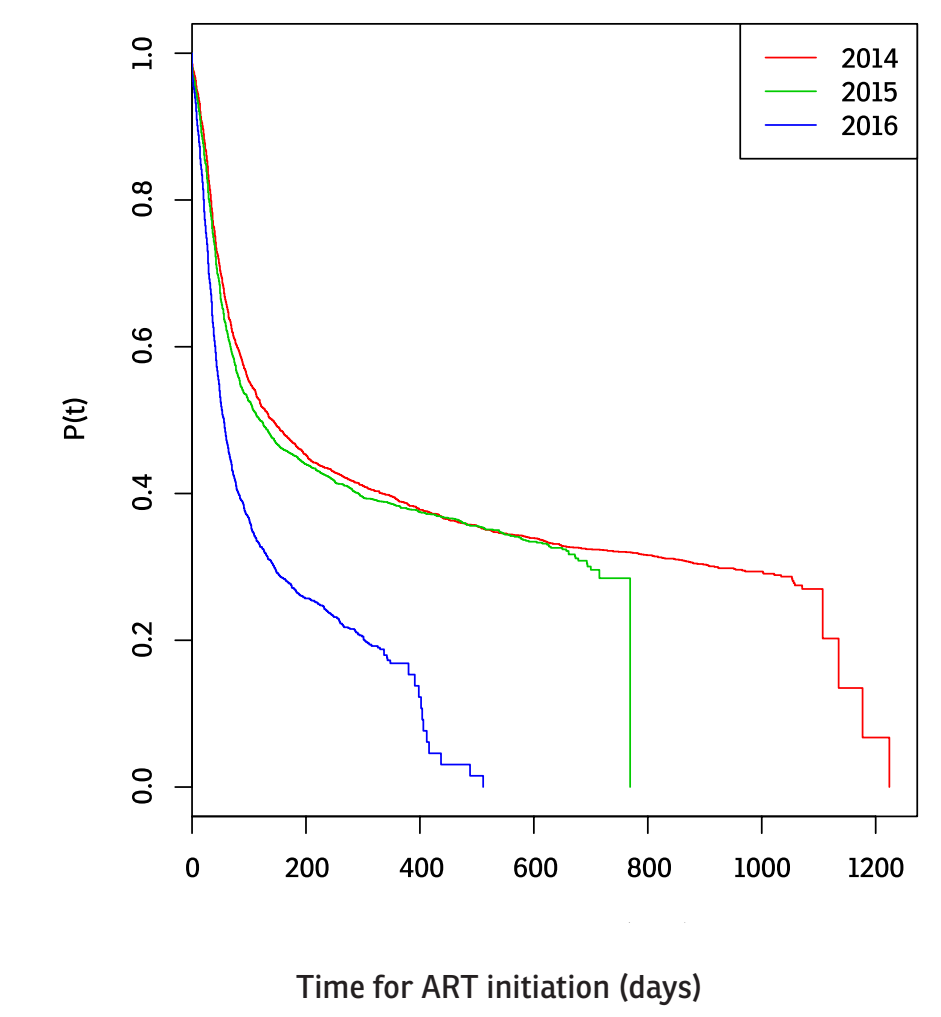
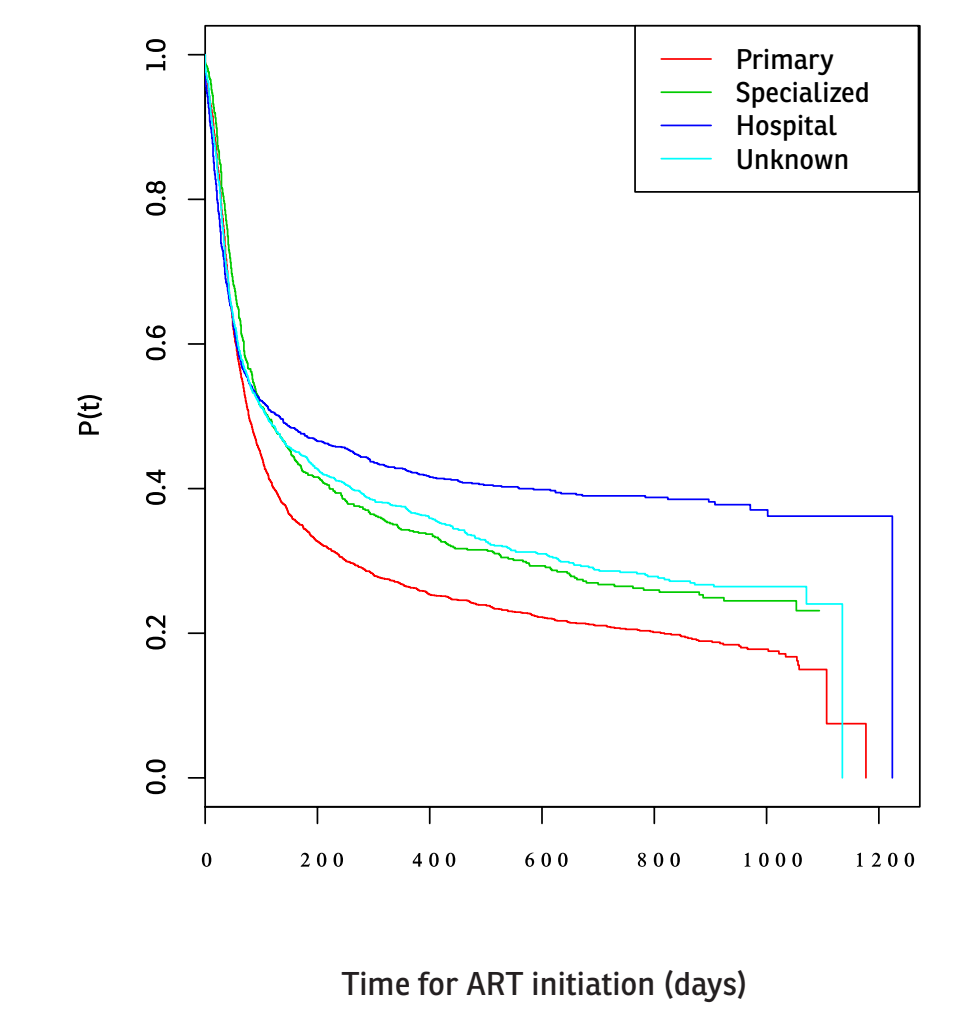


Figure 4 - Kaplan Meier curves of the median time for ART initiation among PLWHIV who started treatment, according to service complexity level, between 2014 and 2016 in the Municipality of Rio de Janeiro



CONCLUSION

This study showed that PHC can be considered a strategic health facility since it is able to provide earlier ART initiation, also playing a crucial role on HIV response. Hence, PHC can scale up PLWHIV access to care and to ART initiation. Furthermore, these results also reinforce the need of comprehensive and multi-sectorial health policies for low-middle income countries.