

Prevalence of and odds for treatment failure by migrant status in people living with HIV in Sweden

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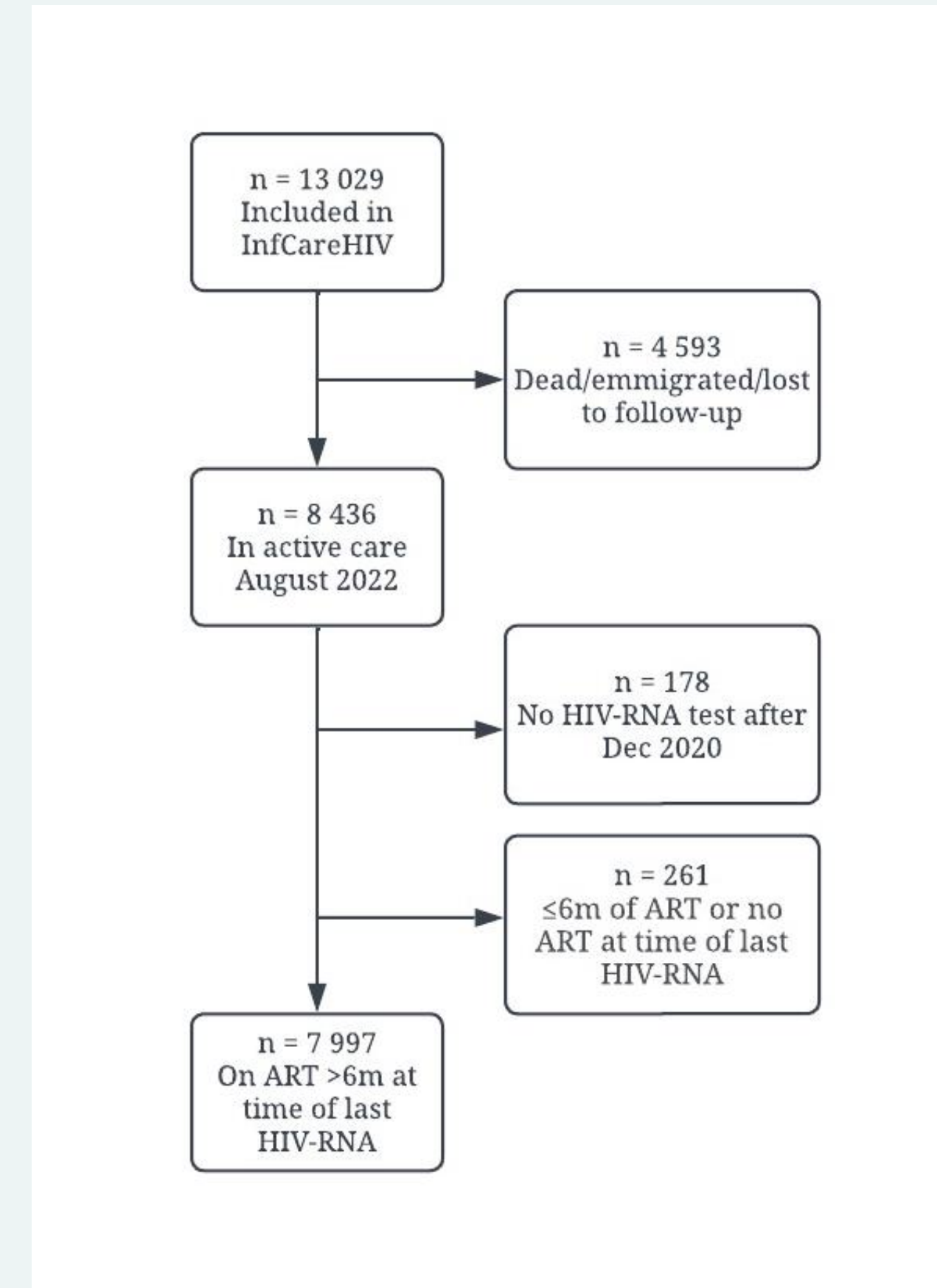
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Background

In the Swedish HIV cohort, a slightly higher proportion of migrants, defined as individuals born outside of Sweden, have been seen to have treatment failure compared to natives.

Aims

Assess the prevalence and odds for treatment failure in the Swedish HIV cohort by migrant status, and to assess which covariates are associated with treatment failure.



Flow chart of the inclusion process

Method

Data from all people living with HIV (PLWH), alive on the 1st of August 2022, were collected from InfCareHIV. Treatment failure was defined as having HIV RNA >200 copies/mL at the last registered measurement, given that the patient had been on ART at least six months at the time. Prevalence was calculated and logistic regression analysis was performed to estimate adjusted odds ratios (adjOR) with 95% confidence interval. Adjustments were made for sex, age, HIV acquisition mode, nadir CD4 and time since HIV diagnosis.

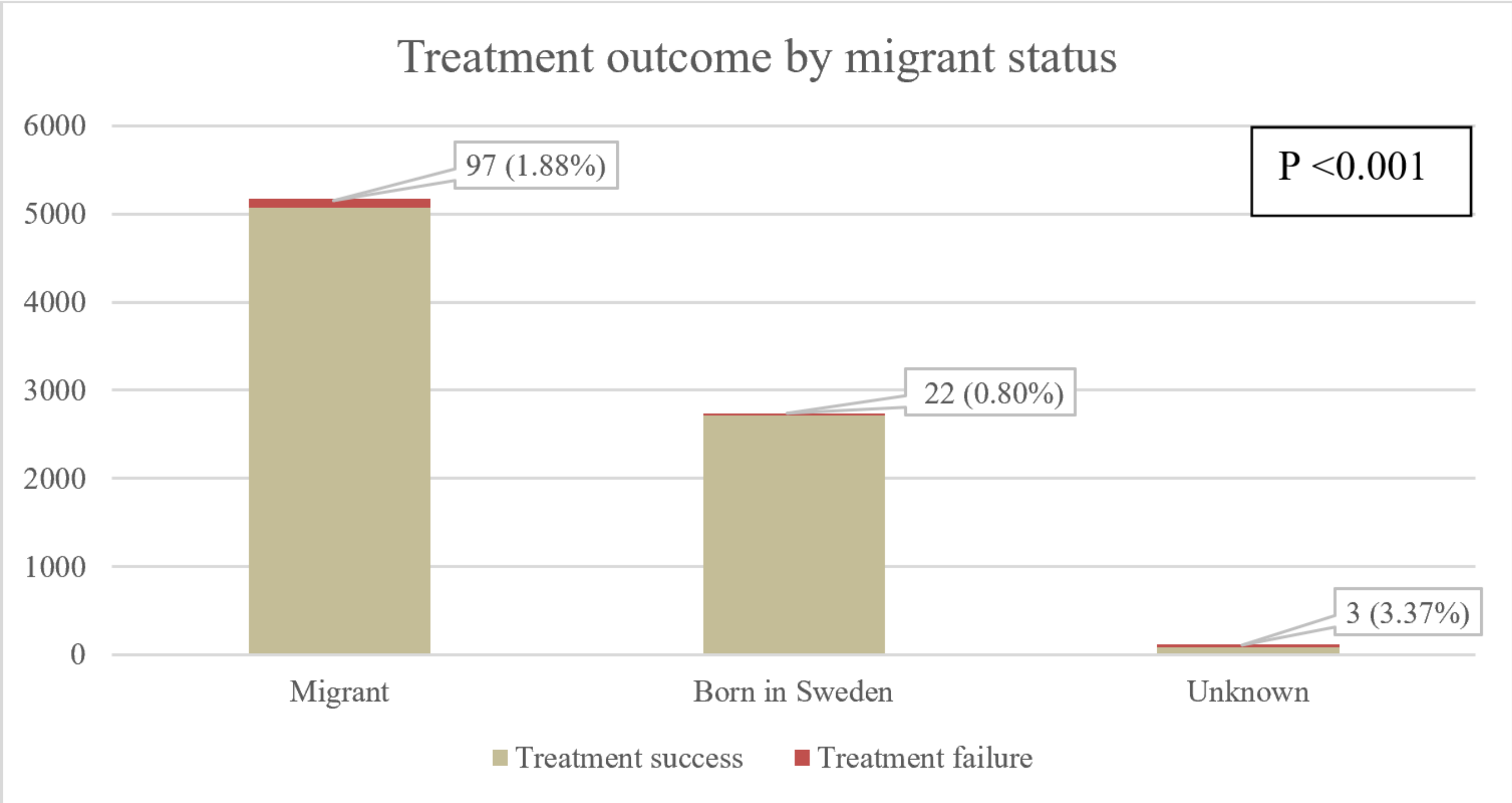
Results

A larger proportion of migrants had treatment failure (1.9%) compared to people born in Sweden (0.8%), $p<0.001$, and two times higher odds for treatment failure (adjOR 1.8, 1.06–2.99). Variables associated with treatment failure were:

- Sub-Saharan Africa (SSA) as birth region (adjOR 2.2, 1.27–3.84)
- High peak HIV RNA (adjOR 2.3, 1.56–3.45)
- Low (<250) nadir CD4 count (adjOR 2.3, 1.05–4.91)
- Low (<250) current CD4 count (adjOR 21.8, 13.11–36.21)
- Protease inhibitor (PI) as current anchor drug (adjOR 1.8, 1.10–2.97)

The variable associated with lower odds of treatment failure was:

- Non-nucleoside reverse transcriptase inhibitor (NNRTI) as current anchor drug (adjOR 0.3, 0.15–0.67)



Treatment outcome by migrant status

	All	HIV RNA <200 after ≥6 months on ART	HIV RNA ≥200 after ≥6 months on ART	Statistical significance (p-value)
Study participants	7 997	7 875	122	
Sex, n (%)				0.009
Male	4 844 (60.57)	4 784 (60.75)	60 (49.18)	
Female	3 139 (39.25)	3 077 (39.07)	62 (50.82)	
Unknown	14 (0.18)	14 (0.18)	0	
Age (years), median (IQR)	51 (42-59)	51 (42-59)	46 (38-56)	0.001
Age at diagnosis (years), median (IQR)	33 (27-42)	33 (27-42)	31 (23-37)	<0.001
Migrant, n (%)	5 171 (64.66)	5 074 (64.43)	97 (79.51)	<0.001
Missing, n (%)	89 (1.11)	86 (1.09)	3 (2.46)	
Birth region, n (%)				0.001
Sub-Saharan Africa	2 881 (36.03)	2 815 (35.75)	66 (54.10)	
Sweden	2 737 (34.23)	2 715 (34.48)	22 (18.03)	
Asia and Pacific	828 (10.35)	819 (10.40)	9 (7.38)	
Eastern Europe and Central Asia	469 (5.86)	460 (5.84)	9 (7.38)	
Western Europe except Sweden	376 (4.70)	373 (4.74)	3 (2.46)	
Latin America and the Caribbean	353 (4.41)	347 (4.41)	6 (4.92)	
Middle East and North Africa	228 (2.85)	224 (2.84)	4 (3.28)	
North America	34 (0.43)	34 (0.43)	0	
Unknown	91 (1.14)	88 (1.12)	3 (2.46)	
Mode of HIV transmission, n (%)				<0.001
Heterosexual	4 055 (50.71)	3 989 (50.65)	66 (54.10)	
Homo/bisexual	2 573 (32.17)	2 553 (32.42)	20 (16.39)	
IDU	331 (4.14)	324 (4.11)	7 (5.74)	
Mother to child	246 (3.08)	240 (3.05)	6 (4.92)	
Blood products	110 (1.38)	107 (1.36)	3 (2.46)	
Unknown or other	576 (7.20)	558 (7.09)	18 (14.75)	
Missing	106 (1.33)	104 (1.32)	2 (1.64)	
Anchor drug, n (%)				
Integrase inhibitor	5 415 (67.71)	5 326 (67.63)	89 (72.95)	0.212
Protease inhibitor	984 (12.30)	957 (12.15)	27 (22.13)	0.001
NNRTI	1 977 (24.72)	1 966 (24.97)	11 (9.02)	<0.001
Multiple anchor drugs, n (%)				
Integrase inhibitor + NNRTI	137 (1.71)	135 (1.71)	2 (1.64)	1.00
Integrase inhibitor + Protease inhibitor	227 (2.84)	224 (2.84)	3 (2.46)	1.00
NNRTI + Protease inhibitor	48 (0.60)	48 (0.61)	0	1.00
First CD4 (cells/mL), median (IQR)	360 (190-550)	360 (190-550)	348 (230-567)	0.602
Last CD4 (cells/mL), median (IQR)	620 (470-820)	630 (470-820)	340 (220-570)	<0.001
Nadir CD4 (cells/mL), median (IQR)	230 (120-360)	230 (121-360)	195 (80-290)	0.020
First HIV RNA (copies/mL), median (IQR)	27 000 (1 300-143 000)	26 900 (1 250-143 000)	40 850 (4 000-138 000)	0.193
Last HIV RNA (copies/mL), median (IQR)	0 (0-0)	0 (0-0)	2 495 (424-15 300)	<0.001
Peak HIV RNA (copies/mL), median (IQR)	83 000 (12 000-344 000)	82 000 (12 000-340 000)	159 500 (43 400-720 000)	<0.001
Decade of HIV diagnosis, n (%)				0.349
1983-1996	1 355 (16.94)	1 331 (16.90)	24 (19.67)	
1997-2006	2 147 (26.85)	2 116 (26.87)	31 (25.41)	
2007-2016	3 337 (41.73)	3 292 (41.80)	45 (36.89)	
2017-2022	1 032 (12.90)	1 014 (12.88)	18 (14.75)	
Unknown	126 (1.58)	122 (1.55)	4 (3.28)	
Months since HIV-diagnosis, median (IQR)	174 (103-258)	174 (103-258)	175 (103-267)	0.958
AIDS, n (%)	918 (11.48)	902 (11.45)	16 (13.11)	0.568

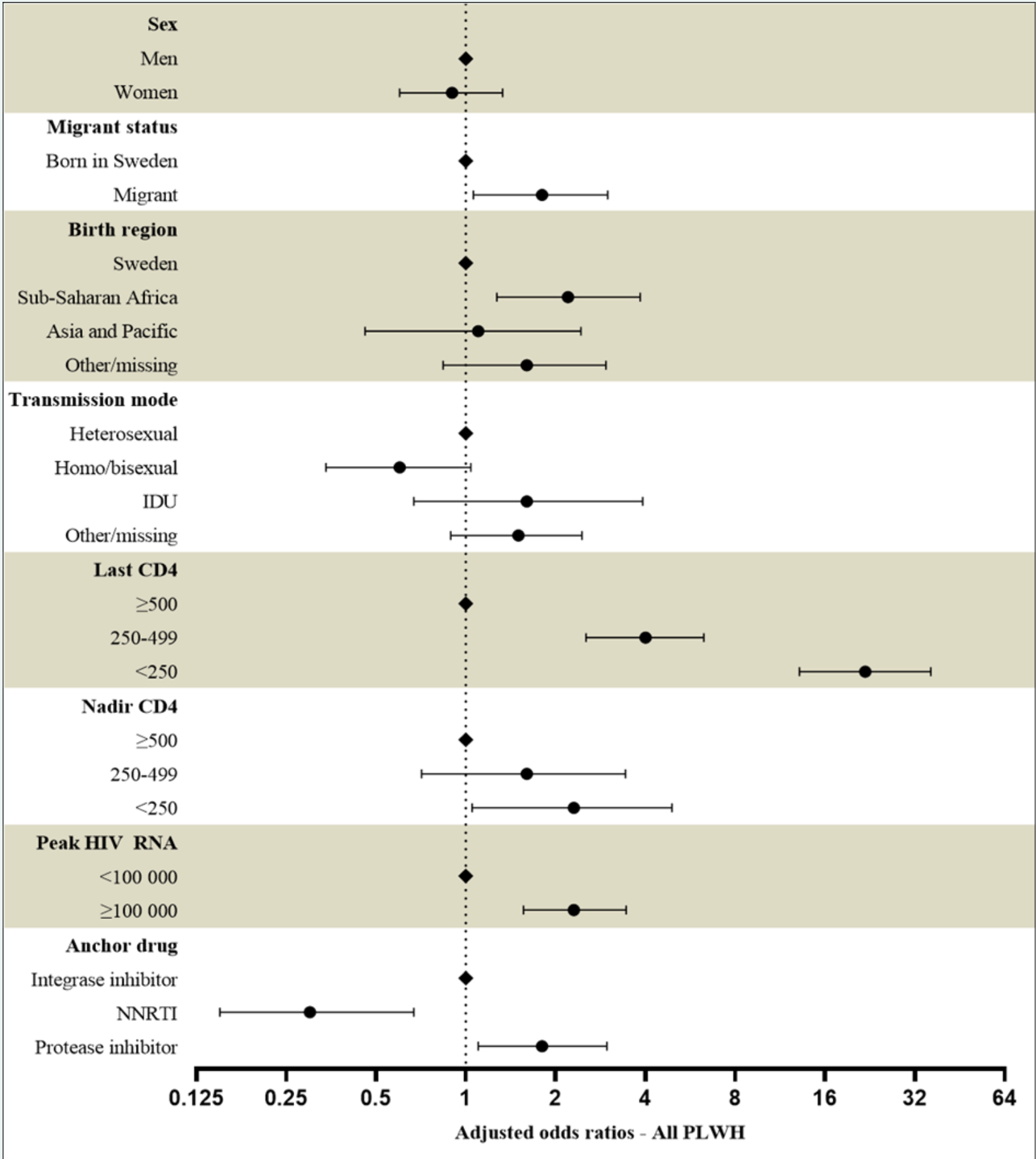
Characteristics of study participants categorised by treatment outcome. P-values for sex, migrant, birth region, integrase inhibitor, protease inhibitor, non-nucleoside transcriptase inhibitor and AIDS were calculated with Chi2. P-values for mode of transmission, integrase inhibitor + NNRTI, integrase inhibitor + protease inhibitor, NNRTI + protease inhibitor and decade of HIV diagnosis were calculated with Fisher's exact. P-values for age, age at diagnosis, first-, last- and nadir CD4, first-, last- and peak HIV RNA and months since HIV diagnosis were calculated with Wilcoxon rank-sum. Significant values in bold.

Conclusions

- Migrants had higher prevalence and odds for treatment failure
- This was associated with SSA origin, low nadir and current CD4 and high peak HIV-RNA
- Current anchor drugs, PI and NNRTI, were associated with higher and lower odds for treatment failure respectively, which is most likely related to which anchor drug is chosen depending on treatment history
- It is essential to identify which PLWH are at a higher risk of treatment failure and ensure that they have support and tools necessary to reach a successful treatment outcome

Future studies

Include data on treatment resistance history and patient-self-assessed adherence.



Forest plot of the adjusted odds ratios for variables predicting treatment outcome for all PLWH.



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