Time to Suboptimal Treatment Patterns Among People With HIV on Antiretroviral Therapy in the United States

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Conclusions

- In a large claims database with 73,533 people with HIV, approximately half experienced ≥1 period of suboptimal adherence to their daily oral antiretroviral therapy regimen during each year of the study period
- Treatment interruptions/discontinuations were relatively common
- The annual incidence of suboptimal adherence and treatment interruptions/discontinuations tended to be higher among treatment-naive people with HIV compared with treatment-experienced people with HIV
- After standardising by age, sex, and region, rates of suboptimal treatment patterns in the HealthVerity database were similar to those of a Centers for Disease Control and Prevention standard population of people with HIV who received HIV care, suggesting generalisability of the findings
- Adherence and persistence with daily oral antiretroviral therapy are ongoing challenges to treatment success and public health in the United States
- Providers, payers, and people with HIV should select regimens with a high barrier to resistance and a simplified administration schedule to promote population-level treatment impact and aid ongoing efforts to end the HIV epidemic

Plain Language Summary

- In order to live longer and healthier lives, people with HIV who take currently recommended oral HIV medicines need to stay on their medication and take it daily
- This study looked at how many times people with HIV in the United States stopped their treatment over a certain amount of time or did not take it as told by their doctor or health care provider
- About half of people with HIV in this study had at least 1 period where they took their medicines less often than they were instructed during each year of the study
- In addition, people with HIV who had never been treated with HIV medicines before were less likely to stay on their HIV treatment as prescribed compared with those who had taken HIV medicines in the past
- The study showed that taking HIV medicines every day is hard to do for some people with HIV in the United States, especially for those who are new to treatment
- In conclusion, it is important to use HIV medicines that are hard for the virus to resist and with directions that are easy to follow

References: 1. Tadese BK, et al. *AIDS Care.* 2024;36:1869-81. **2.** Trickey A, et al. *Lancet HIV.* 2024;11;e176-85. **3.** Hawkins C, et al. *J Antimicrob Chemother.* 2016;71:1966-74. **4.** de Los Rios P, et al. *Prev Med.* 2020;139:106182. **5.** Centers for Disease Control and Prevention. AtlasPlus HIV status and care 2017-2023. Accessed 28 July 2025. https://www.cdc.gov/nchhstp/about/atlasplus.html. **6.** Benson C, et al. *AIDS Behav.* 2020;24:3562-73. **7.** Lai H, et al. *J Antimicrob Chemother.* 2023;78:1934-43. **8.** US Department of Health and Human Services Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Accessed 6 August 2025. https://clinicalinfo.hiv.gov/en/guidelines/adult-and-adolescent-arv.

Introduction

- Despite advances in the effectiveness, dosing, and tolerability of modern antiretroviral therapy (ART), some people with HIV (PWH) may still struggle with suboptimal adherence, resulting in inadequate HIV viral suppression and poor outcomes[1-4]
- The Centers for Disease Control and Prevention (CDC) reported that approximately 821,891 PWH in the United States received medical care during 2023[5]
- However, even with modern daily oral ART regimens, suboptimal treatment patterns, including treatment interruptions (TIs), discontinuations, and poor adherence, remain challenging for some PWH, and new cases of HIV transmission persist[4-7]
- Understanding the current, context-dependent patterns of suboptimal treatment in PWH in the United States is necessary to recognise the potential public health impact to certain ART regimens with a high genetic barrier to resistance and a simplified administration schedule

Objective

- To provide updated observations of daily oral ART adherence and persistence using an age group-sex-region standardisation method to improve generalisability and better understand times when PWH may struggle with suboptimal treatment behaviours

Methods

- This was an observational, retrospective, descriptive cohort study conducted using US HealthVerity Marketplace closed medical and pharmacy claims
- Eligible PWH were aged ≥18 years, had a medical claim for an HIV diagnosis, had ≥365 days of continuous baseline enrolment and ≥180 days of follow-up, and had ≥2 consecutive pharmacy claims for any oral ART regimen listed as "recommended for most PWH" in the US Department of Health and Human Services treatment guidelines[8]
- A patient's follow-up time was subdivided into sequential contiguous 90-day blocks starting from the index date (the first recorded pharmacy claim for a complete ART regimen)
- Suboptimal adherence was defined as an accumulation of ≥14 days without ART supply within the 90-day blocks, and time to suboptimal adherence was defined as the time until the first accumulation of ≥14 days without ART supply within a 90-day block
- A combined TI/discontinuation outcome was defined as a gap in ART supply >90 days, independent of whether ART was restarted
- For time-to-event analysis, Kaplan-Meier plots were constructed
- Age group-sex-region standardisation was based on estimates by the CDC of PWH receiving any care between 2017 and 2022

Results

Study Population

- A total of 73,533 PWH fulfilled all the inclusion criteria, of whom 60,062 (82%) were treatment naive and 13,471 (18%) were treatment experienced (Table 1)

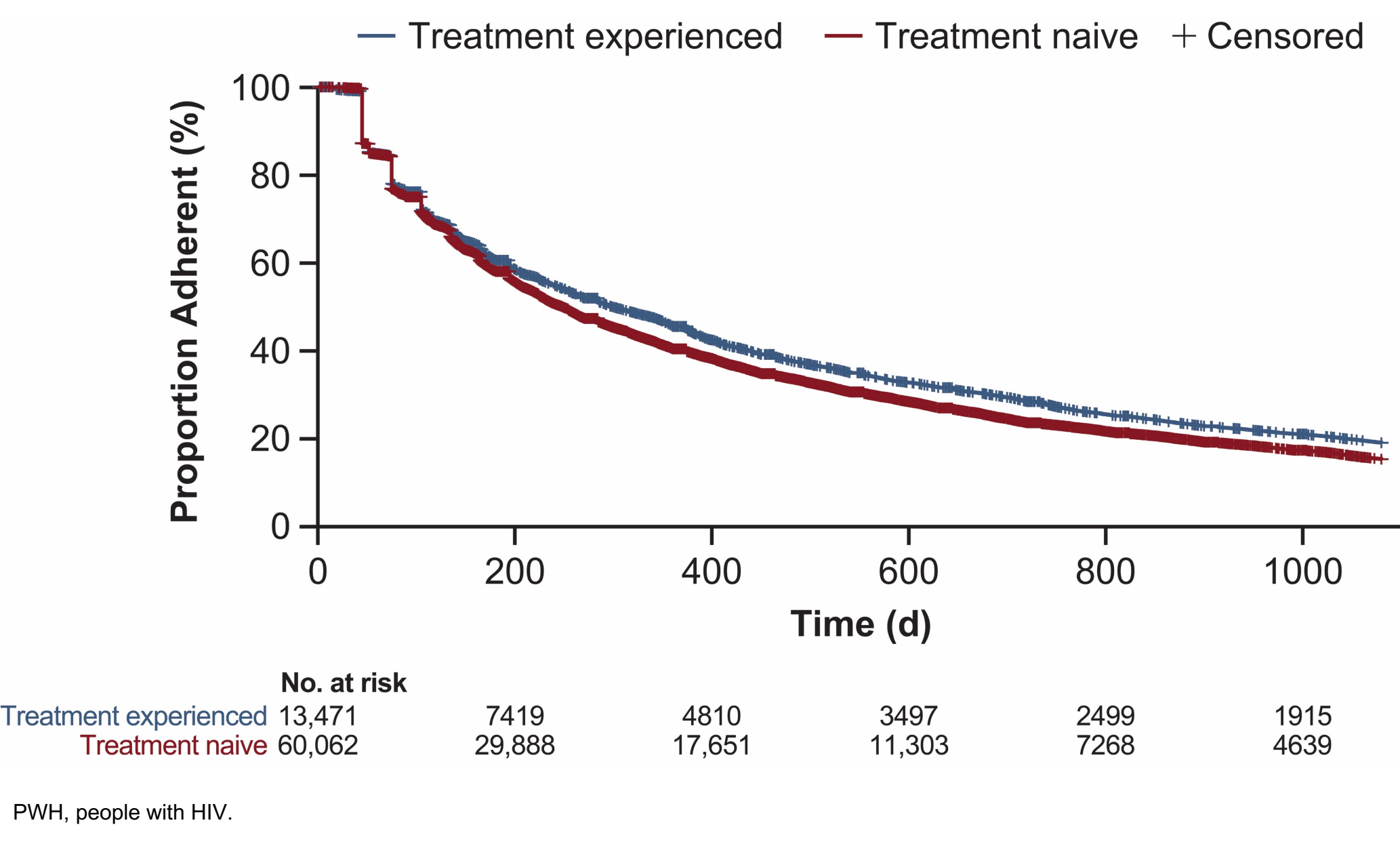#### Table 1. Demographics at Antiretroviral Therapy Index Date

	Treatment Naive (n = 60,062)	Treatment Experienced (n = 13,471)	All PWH (N = 73,533)
Age, y, median (Q1, Q3)	41 (31, 53)	48 (36, 55)	42 (32, 53)
Male sex, n (%)	44,724 (74)	10,193 (76)	54,917 (75)
Region, n (%)			
West	13,331 (22)	1225 (9)	14,556 (20)
Northeast	9954 (17)	2221 (16)	12,175 (17)
South	20,044 (33)	3627 (27)	23,671 (32)
Midwest	7764 (13)	1684 (13)	9448 (13)
Multiple regions	1954 (3)	318 (2)	2272 (3)
Missing	7015 (12)	4396 (33)	11,411 (16)
Most common (≥5%) ART regimens, n (%)			
B/F/TAF	28,405 (47)	844 (6)	29,249 (40)
EVG/c/FTC/(TAF or TDF)	9300 (15)	4108 (30)	13,408 (18)
DTG/ABC/3TC	6288 (10)	2428 (18)	8716 (12)
RPV/(TAF or TDF)/FTC	3379 (6)	2439 (18)	5818 (8)
DTG + (TAF or TDF) + (FTC or 3TC)	4188 (7)	659 (5)	4847 (7)
(DRV/c or DRV/r) + (TAF or TDF) + (FTC or 3TC)	3286 (5)	1072 (8)	4358 (6)

3TC, lamivudine; ABC, abacavir; ART, antiretroviral therapy; B, bictegravir; c, cobicistat; DRV, darunavir; DTG, dolutegravir; EVG, elvitegravir; F or FTC, emtricitabine; PWH, people with HIV; Q1, first quartile; Q3, third quartile; RPV, rilpivirine; TAF, tenofovir alafenamide; TDF, tenofovir disoproxil fumarate.

Adherence

- The mean (SD) follow-up was 1477 (901) days, and the median time to suboptimal adherence was 255 days (Figure 1)
- Time to suboptimal adherence was shorter in treatment-naive PWH compared with treatment-experienced PWH

Figure 1. Kaplan-Meier Curve for Time to Suboptimal Adherence Within Rolling 90-Day Blocks in Treatment-Naive and Treatment-Experienced PWH

No. at risk					
Treatment experienced 13,471	7419	4810	3497	2499	1915
Treatment naive 60,062	29,888	17,651	11,303	7268	4639

PWH, people with HIV.

- From 2017 to 2024, the nonstandardised proportion of PWH per enrolled person-year of follow-up time that had ≥1 block of suboptimal adherence ranged from 47% to 64% (Figure 2)
- The age group-sex-region–standardised proportion of PWH with suboptimal adherence was similar, with minor fluctuations in the trend from 2017 to 2022

Figure 2. Annual Age Group-Sex-Region–Standardised and –Nonstandardised[a] Proportion of ≥1 Rolling 90-Day Block of Suboptimal Adherence Among PWH on ART
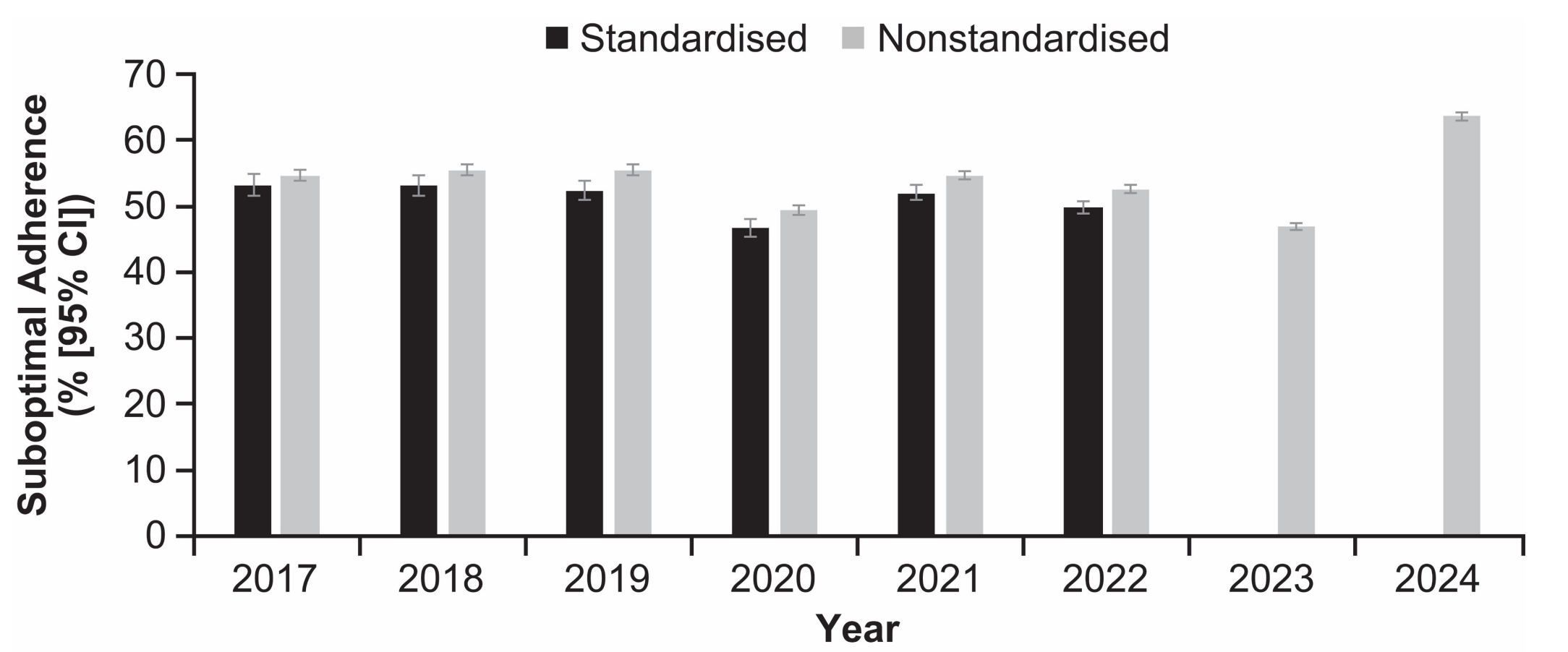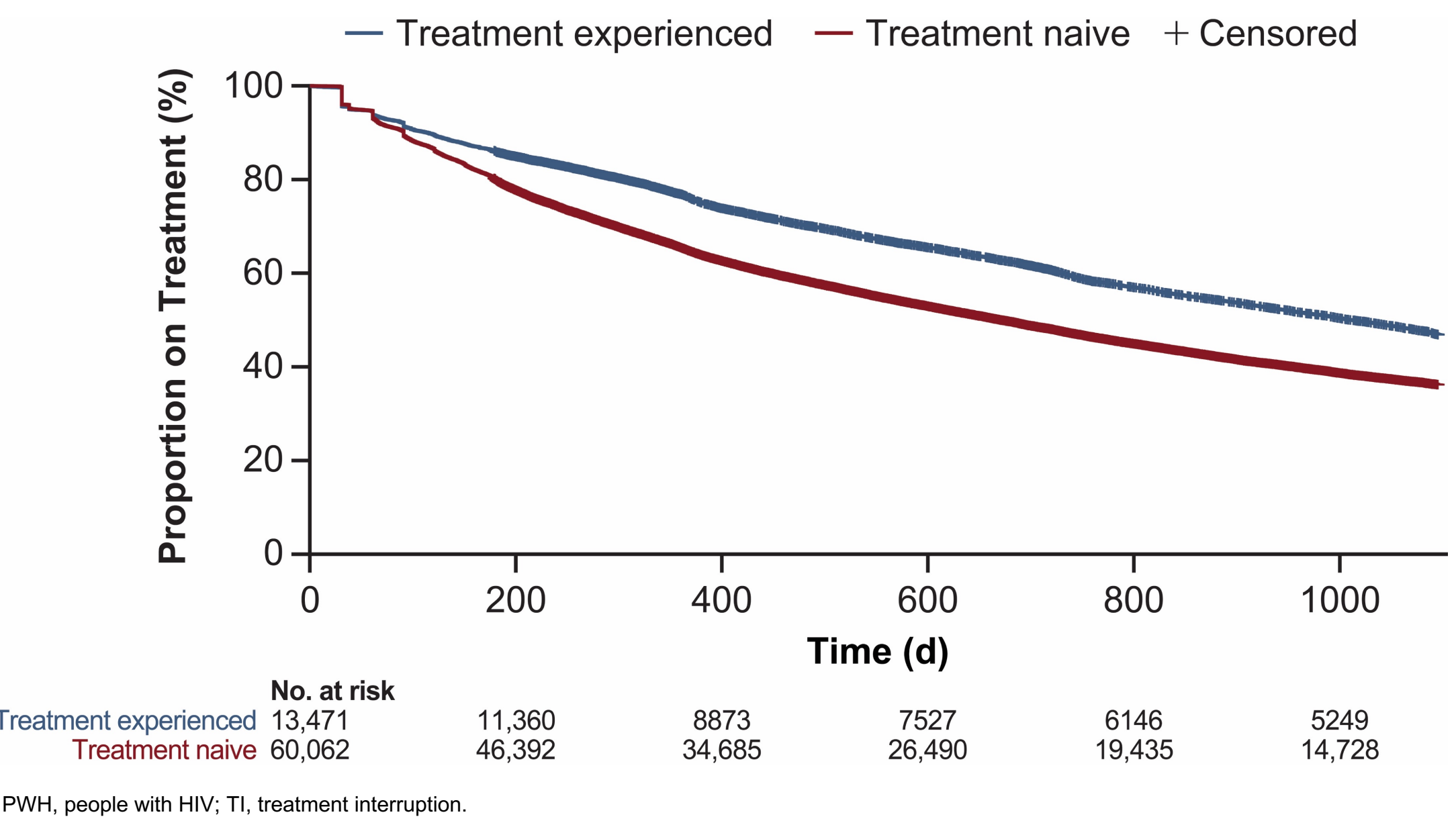

[a]At the time of the analysis, CDC standard populations were only available through 2022; thus, rates for 2023 and 2024 should be interpreted with caution. ART, antiretroviral therapy; CDC, Centers for Disease Control and Prevention; PWH, people with HIV.
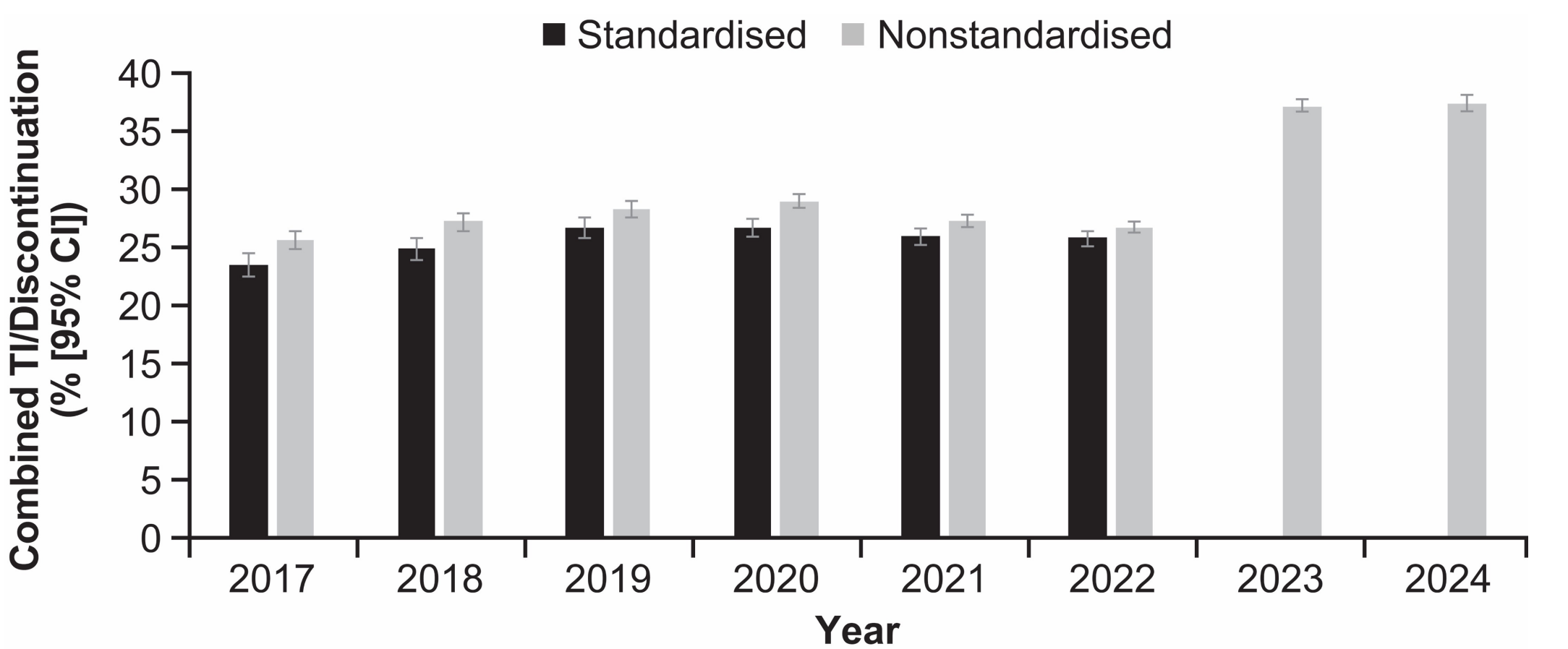
TI and Discontinuation

- The median time to TI/discontinuation was 728 days (Figure 3)
- The time to TI/discontinuation was shorter in PWH who were treatment naive compared with those who were treatment experienced

Figure 3. Kaplan-Meier Curve for Time to TI/Discontinuation in Treatment-Naive and Treatment-Experienced PWH

No. at risk					
Treatment experienced 13,471	11,360	8873	7527	6146	5249
Treatment naive 60,062	46,392	34,685	26,490	19,435	14,728

PWH, people with HIV; TI, treatment interruption.

- From 2017 to 2022, approximately one-quarter (range, 26%-29%) of PWH (nonstandarised) per enrolled patient-year had a TI/discontinuation each year, which was slightly higher in 2023 and 2024; after standardisation for age group, sex, and region, the range was slightly lower at 23% to 27% (Figure 4)

Figure 4. Annual Age Group-Sex-Region–Standardised and –Nonstandardised[a] Proportion of TI/Discontinuation Among PWH on ART

[a]At the time of the analysis, CDC standard populations were only available through 2022; thus, rates for 2023 and 2024 should be interpreted with caution. ART, antiretroviral therapy; CDC, Centers for Disease Control and Prevention; PWH, people with HIV; TI, treatment interruption.