Utilization of Oral Pre-exposure Prophylaxis (PrEP) After FTC/TAF Approval in the United States

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BACKGROUND

- Two oral medications are approved for PrEP in the US: emtricitabine/tenofovir disoproxil fumarate and tenofovir alafenamide (FTC/TDF, FTC/TAF).
- In the DISCOVER trial FTC/TAF exhibited favorable safety outcomes (creatinine clearance, bone mineral density) compared to FTC/TDF.
- This study describes socio-demographic and clinical characteristics of individuals new to PrEP after the approval of FTC/TAF in the US (October 2019) to better understand PrEP prescribing and dispensing patterns in clinical practice.

METHODS

- Data source: EMR and dispensing data from Trio Health HIV Research Network (10/2019-11/2021).
- Included: HIV-negative adults newly prescribed or dispensed oral PrEP (≥1-month supply) with ≥3 months follow-up.
- Excluded: indications of hepatitis B or post-exposure prophylaxis prior to PrEP.
- Comorbidities, socio-demographic and clinical characteristics were compared among those prescribed and (separately) those dispensed FTC/TAF vs FTC/TDF (t-test, chi-square) at the same facilities.
- Classification and regression trees analysis (CART) was utilized to evaluate predictors of prescribing and dispensing FTC/TAF.
- Variables used in CART analysis: age, race, payer, liver function tests at baseline (ALT> upper limit of normal (ULN), AST> ULN), baseline eGFR category (<60, 60-89, 90+ mL/min/1.73m^3), documented "high-risk behavior" at baseline (based on ICD-10), baseline BMI.
- Gender was not used in the model due to high proportion of unspecified gender.

RESULTS

- In the prescription cohort (N=2213), most individuals were prescribed FTC/TAF (1821 [82%] vs. FTC/TDF 392 [18%]). A similar distribution was observed for the dispense cohort (N=1794; FTC/TAF 1551 [86%]; FTC/TDF 243 [14%]).
- In both cohorts, most participants had commercial insurance and FTC/TAF individuals were more likely to be white and male.
- In the prescription cohort, "high-risk behavior" and clinical characteristics, including mean BMI, age, eGFR were similar for FTC/TAF and FTC/TDF among those with available data [Table].
- Individuals dispensed FTC/TAF were more likely to be overweight at baseline (39% vs. 29%; p=.019), with "high-risk behavior" (75% vs. 63%, p<.001), age >50 (16% vs. 11%, p=.041), and less likely to be age ≤25 (13% vs 18%, p=.018).
- Based on CART analysis, primary predictors of prescribing FTC/TAF were payer and race [Figures 1, 3]. The model accuracy was 82%.
- Predictors of dispensing FTC/TAF were more complex: top 3 predictors of dispensing FTC/TAF were age, "high-risk behavior" and payer. Other less important predictors were baseline BMI, eGFR, and liver function tests [Figures 2, 4]. The model successfully predicted 87% of cases.

CONCLUSIONS

- Socio-demographic characteristics were key predictors of both prescribing and dispensing behaviors.
- Individual safety risk factors (e.g., age and renal function) did not appear to factor into prescribing decisions for FTC/TAF vs. FTC/TDF.
- Perception of individual risk for HIV acquisition based on sexual behavior emerged as an important predictor of FTC/TAF dispenses. This finding will need further evaluation in upcoming research.

Table. Characteristics of Individuals Prescribed and Dispensed PrEP After October 2019

n (%); mean (std)		Prescription Cohort (n=2213)		Dispense Cohort (n=1794)	
		FTC/TDF n=392	FTC/TAF n=1821	FTC/TDF n=243	FTC/TAF n=1551
Gender	Male	257 (66)	1312 (72)*	124 (51)	1024 (66)#
	Female	64 (16)#	35 (2)	26 (11)#	16 (1)
	Transgender	4 (1)	16 (1)	0 (0)	1 (0)
	Unspecified or non-binary	67 (17)	458 (25) †	93 (38)	510 (33)
Race	White Race	190 (48)	1020 (56)†	108 (44)	928 (60)#
	Black	79 (20) †	266 (15)	28 (12)	182 (12)
	Asian, America Indian, or Pacific Islander	41 (10)	175 (10)	20 (8)	128 (8)
	Unspecified	82 (21)	360 (20)	87 (36)#	313 (20)
Payer	Commercial	264 (67)	1173 (64)	116 (48)	949 (61)#
	Medicare	5 (1)	40 (2)	2 (1)	34 (2)
	Medicaid	49 (13) †	148 (8)	24 (10)	106 (7)
	Ryan White	0 (0)	3 (0)	0 (0)	3 (0)
	Other plan or self-pay	35 (9)*	103 (6)	9 (4)	34 (2)
	Unknown	39 (10)	354 (19)#	92 (38)†	425 (27)
Age	18-25 years	61 (16)	326 (18)	44 (18)	195 (13)*
	26-50	282 (72)	1250 (69)	173 (71)	1112 (72)
	51+	49 (13)	245 (13)	26 (11)	244 (16)*
"High-risk Behavior"[1]		279 (71)	1372 (75)	154 (63)	1156 (75) #
eGFR[2] (>90 mL/min/1.73m^3)		257 (74)	1105 (73)	133 (75)	892 (70)
BMI[3]	Underweight <18.5 kg/m^2	13 (4)	43 (3)	9 (6)	40 (4)
	Normal 18.5-24.9	118 (39)	490 (39)	64 (41)	403 (37)
	Overweight 25-30	102 (34)	465 (37)	45 (29)	419 (39)*
	Obese >30	68 (23)	266 (21)	37 (24)	219 (20)

*p<0.05; †p<0.01; #p<0.001 FTC/TDF vs FTC/TAF.
[1]"High-risk Behavior": ICD-10 codes for "high-risk sexual behavior" and exposure to communicable diseases.
[2]eGFR= estimated glomerular filtration rate; eGFR values available for 84% (1865) of those prescribed and 81% (1457) of dispensed.
[3]BMI= body mass index; BMI available for 69% of prescribed and 71% of dispensed.

Figure 1. CART Tree For Prescription Cohort

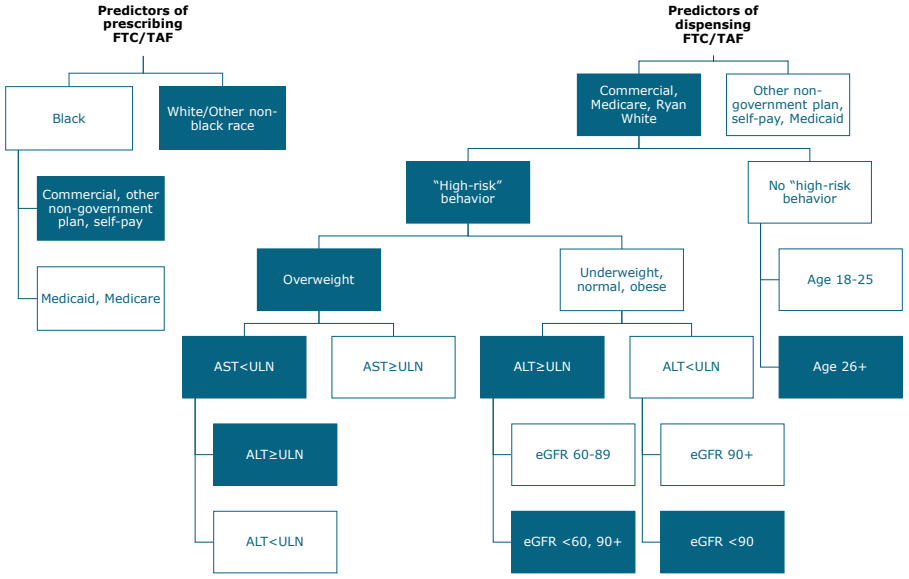


Figure 2. CART Tree For Dispense Cohort

GUIDE FOR READING CART TREE : Each level shows primary predictors given the prior split. Example from prescriber tree:
1. *Individuals of Black race were less likely to be prescribed FTC/TAF vs other races.*
2. *Among Black race, those insured with Medicare/Medicaid were less likely to be prescribed FTC/TAF vs other plans.*

Figure 3. Predictors of Prescribing FTC/TAF by Normalized Importance to CART Model

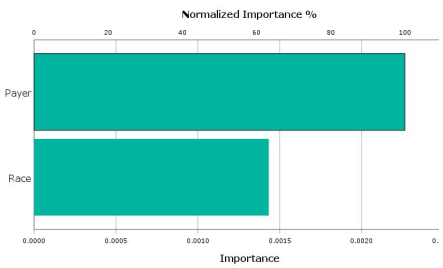
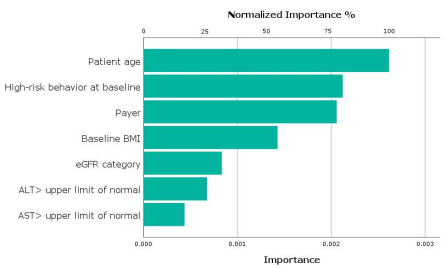


Figure 4. Predictors of Dispensing FTC/TAF by Normalized Importance to CART Model



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