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# A comparison of F/TAF and F/TDF as HIV pre-exposure prophylaxis in a predominantly cisgender women population in East and South Africa: a randomised, factorial, non-inferiority trial

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## ABSTRACT

### Background

F/TAF was shown to be non-inferior to F/TDF as pre-exposure prophylaxis (PrEP) in men, but approval was not extended to cisgender women. We report the results of PrEPVacc, in which a predominantly female population was randomly allocated to receive daily oral F/TDF or F/TAF for ~6 months within a HIV-1 prophylactic vaccine trial.

**Setting**

Five study sites in three African countries (Uganda, Tanzania, South Africa)

**Methods**

The two regimens were compared by the averted infections ratio (AIR) – the proportion of infections averted by F/TAF relative to F/TDF. The counterfactual HIV incidence, an essential component of this metric, was derived from a preceding registration cohort. Dried blood spots (DBS) were collected at regular timepoints for later assessment of tenofovir diphosphate levels in selected sub-populations.

**Results**

1380 participants (697 F/TDF, 683 F/TAF) were included in the primary analysis (total follow-up 709.2 person-years); 87% were cisgender women. Three HIV infections (0.86/100 person-years) occurred in the F/TAF group versus two in the F/TDF group (0.56/100 person-years). The counterfactual HIV incidence was estimated to be 2.59/100 person-years (90% CI 1.86-3.52), giving an AIR of 0.85 (90% CI 0.31-1.66). Based on the week 8 DBS sample , only an estimated 14% of participants were classified as taking 2-3 tablets per week and 9% ≥4 tablets per week.

**Conclusions**

Despite similar HIV incidence rates, the non-inferiority of F/TAF was not demonstrated, probably due to low statistical power primarily driven by low adherence. However, there is compelling evidence from multiple studies supporting the efficacy of F/TAF as PrEP regardless of sex.

## INTRODUCTION

An estimated 1.3 million individuals acquired HIV in 2023; in sub-Saharan Africa, 62% of new infections occurred in women and girls.[1] Oral emtricitabine combined with tenofovir disoproxil fumarate (F/TDF) is highly effective pre-exposure prophylaxis (PrEP) when taken as instructed to prevent HIV acquisition.[2-6] Access to F/TDF or generic equivalents has increased worldwide since the first trial reported in 2010.[3] Over the subsequent period, HIV incidence has declined by 39%, albeit far short of targets set by UNAIDS.[1] Daily oral PrEP has undoubtedly contributed to this decline, alongside increased access to HIV testing and universal treatment.[7, 8] Although there is good evidence supporting the biological efficacy of oral F/TDF in cisgender women,[2] long-acting injectables proved superior to oral daily F/TDF in two double-dummy trials in adolescent girls and young women in sub-Saharan Africa, largely explained by a difference in adherence.[9, 10]

Clinical pharmacology studies have observed a shorter time to effective levels of active drug in peripheral blood mononuclear cells (PBMCs) with emtricitabine combined with tenofovir alafenamide (F/TAF) than with F/TDF, and similar or higher levels of active drug in the female genital tract.[11, 12] F/TAF was shown to be non-inferior to F/TDF in a randomised blinded trial in cisgender men and transgender women having sex with men,[13] supporting the approval of F/TAF as PrEP by the US Food and Drug Administration in this population. However, due to a lack of clinical trial data, approval was not extended to cisgender women.[14]

The PrEPVacc prophylactic HIV vaccine trial was conducted in East and South Africa in a population that was predominantly cisgender women, with enrolment largely from a preceding registration cohort.[15] In anticipation of PrEP being provided as part of any future national HIV vaccine roll-out while vaccine-induced immune responses develop, oral PrEP was offered for approximately six months at the time of the first vaccination. This provided the opportunity to compare F/TAF to F/TDF through a second randomisation, the results of which are presented in this paper. Although a systematic review suggested similar study populations prefer injectable methods for prevention,[16] we anticipated that providing oral PrEP as a study drug rather than routine service would encourage greater uptake and adherence than observed in previous HIV vaccine trials enabling comparison of the two regimes.[17, 18]

## METHODS

### Study Design

PrEPVacc was a multi-centre, factorial, randomised trial whose primary objective was to assess two novel HIV-1 prophylactic vaccines. The primary injection schedule consisted of three vaccinations given over a period of 24 weeks. To provide protection against HIV infection while any vaccine immune response was developing, participants were provided with oral PrEP as a study drug, to be taken daily. Injectable PrEP had not been approved when PrEPVacc was being designed. Simultaneous with the randomisation to vaccine, participants were randomised to be offered one of two daily PrEP regimens, F/TDF or F/TAF. This trial is registered with the ClinicalTrials.gov Clinical Trials Register (NCT04066881).

### Participants

An observational pre-trial registration cohort was set-up at five study sites in four countries: Masaka (Uganda), Mbeya and Dar es Salaam (Tanzania), Durban (South Africa), and Maputo (Mozambique). Enrolment to the cohort started in July 2018. Individuals were eligible to participate if they were HIV-negative, aged 18-45 years, and deemed to be vulnerable to acquisition of HIV infection. Clinic visits were conducted every three months, and included HIV testing and counselling, monitoring of PrEP usage, and interviewer-administered questionnaires on behavioural and other HIV risk factors.

The registration cohort allowed study sites to establish infrastructure and hone procedures while the trial was being set up. It also provided an opportunity to estimate the underlying HIV incidence in the study population, which is now recognised as critical information in the interpretation of active-control HIV prevention trials.[19, 20] The HIV incidence rate at one of the study sites (Maputo) was below the threshold set for inclusion in the randomised trial (2 per 100 person-years). The original protocol stipulated that participants had to have at least

three months follow-up in the registration cohort before they could be randomised, but in order to enhance recruitment this was modified in September 2021 to allow direct enrolment into the trial.

Eligibility criteria for both randomisations included: aged between 18 and 40 years; negative HIV test result at screening and enrolment; willing to use a highly effective method of contraception from screening until 18 weeks after last injection (if female); willing to comply with the study procedures and visit schedule. A complete list of eligibility criteria is given in the study protocol.[21]

**Randomisation and masking**

Randomisation took place within 8 weeks of the screening visit. Participants were randomised in a 1:1:1 ratio to one of two investigational vaccine arms (DNA-AIDSVAX or DNA-CN54gp140-MVA) or to placebo. Participants were simultaneously randomised in a 1:1 ratio to be offered either F/TDF or F/TAF as their PrEP study drug. Participants were dispensed sufficient study drug to take it daily until at least two weeks after administration of the third vaccination. Randomisation to each of the six treatment combinations (three vaccine arms times two PrEP arms) was stratified by site and sex at birth using permuted blocks of varying sizes; randomisation was performed centrally using a random number generator.

Although staff were aware of the randomised PrEP allocation at or after randomisation, participants only knew when the drug was first dispensed, since the pills are noticeably different in colour and size.

**Procedures**

The primary injection schedule consisted of three vaccinations scheduled to be given over a period of 24 weeks (at enrolment, weeks 4 and 24), with a further booster vaccination at

week 48. However, because of supply issues, the third vaccination was delayed up to 17 weeks in some participants. PrEP was dispensed at enrolment, weeks 4, 16, and possibly 24 (in participants whose third vaccination was delayed), to ensure that sufficient PrEP was provided to last until 2 weeks after the third vaccination. Excess study drug was not retrieved and participants were referred to local providers of PrEP (always F/TDF) after the PrEP study period. Participants were followed up for a target of 74 weeks, or trial closure if later.

Clinic visits were scheduled at screening, weeks 0 (enrolment), 4, 8, 16, 24, 26, 30, 38, 48, 50, and every 12 weeks thereafter. At screening and enrolment, HIV testing was conducted according to the national algorithm in each country; discordant rapid tests were assessed using the BioRad GenScreen ULTRA ELISA. Thereafter, this assay was used in real-time at each visit. Putative HIV infections were confirmed with an HIV RNA assay, and previous stored samples were tested to determine the timing of HIV infection. The first sample with detectable virus was selected for resistance testing.

Urine samples were tested in real-time for the presence of tenofovir at weeks 4, 8, and 16, and results discussed with participants. This was done to help improve the accuracy of self-reported PrEP use and identify barriers to adherence. Dried blood spots (DBS) were collected at weeks 0, 8, 26, 48, 74, and every 24 weeks thereafter for later assessment of tenofovir diphosphate (TFV-DP) levels in selected sub-populations. In all participants with a confirmed HIV diagnosis, the week 8 DBS sample and the closest sample to detection of virus were tested. In addition, 600 participants were randomly selected from those who remained HIV-uninfected (excluding those never dispensed PrEP), for testing of their week 8 DBS samples. TFV-DP levels were categorised as below the limit of quantification (<8.7 fmol/punch), low adherence (<2 tablets per week), medium adherence (2-3 tablets per week), or high adherence (≥4 tablets per week) based on analyses from previous studies (Appendix pp 6-7). The following questions on PrEP usage were asked at visits: (a) have you taken PrEP tablets since your last visit? (b) how many days ago did you last take your

PrEP tablets? (c) how many PrEP tablets did you take in the two days before/after the last time you had sex without a condom?

**Outcomes**

The primary effectiveness outcome for the PrEP randomisation was a confirmed HIV infection at or before the visit scheduled for two weeks after the third vaccine (approximately 26 weeks from enrolment). The primary safety outcome was a clinical decision to discontinue the PrEP regimen for an adverse event considered to be related to the PrEP drug. Secondary outcomes included resistance mutations selected by the study drugs (among individuals who seroconverted), and adherence assessed by: (a) self-report (b) point-of-care urine tests (c) TFV-DP levels measured in DBS (d) total number of pills dispensed.

**Statistical analysis and sample size**

The main objective of the analysis was to demonstrate that the effectiveness of F/TAF was not unacceptably lower than F/TDF in preventing the acquisition of HIV infection (the non-inferiority paradigm). The primary analysis population was all randomised participants, excluding those found to be HIV-positive at enrolment, those who were never dispensed PrEP, or those with no follow-up HIV tests. The incidence rate of new HIV infections between arms was compared by the Averted Infections Ratio (AIR), which reflects the proportion of infections prevented by F/TAF that would be prevented by F/TDF.[19] An AIR value <1 favours F/TDF; a value >1 favours F/TAF. Confidence intervals (CIs) were computed using likelihood-based methods.[22] Because non-inferiority inference was based on the lower 5% confidence limit, effect estimates are presented with 90% CIs. Two approaches were used to estimate the counterfactual placebo incidence. First, we modelled the HIV incidence predicted among trial participants using data from the registration cohort. Second, we directly calculated the HIV incidence in trial participants during the trial phase when study PrEP was no longer dispensed (Appendix pp 2-3).

The total sample size of 1668 participants was determined based on statistical power considerations for the vaccine comparisons. Assuming a counterfactual incidence rate of 4 per 100 person-years and 10% loss to follow up, the probability of showing at least 50% preservation-of-effect was estimated to be 56%, 78%, and 96% if the effectiveness of F/TDF was 60%, 70%, or 80%, respectively.

**RESULTS**

A total of 1512 participants were randomly allocated to the F/TDF group or F/TAF group between December 2020 and March 2023 (Figure 1). Excluding 3 participants who were found to be HIV seropositive at baseline, 92 who declined the offer of study PrEP, and 37 without any follow-up HIV tests, a total of 1380 participants contributed 709.2 person-years follow-up to the primary analysis. Baseline characteristics were balanced between the two groups (Table 1). The median age of participants was 25 years, 87% were cisgender women, 60% self-reported as sex workers (69% of all cisgender women), and the median number of condomless sex partners in the previous 3 months was 4 (IQR: 2-10). Only 4% of participants reported ever having used PrEP previously. 62% of participants had enrolled in the registration cohort, with the remaining 38% being enrolled directly into the trial.

A total of 5 incident HIV infections during the study PrEP period were observed: 3 in the F/TAF group (0.86/100 person-years, 90% CI 0.23-2.22) and 2 in the F/TDF group (0.56/100 person-years, 90% CI 0.10-1.75), equating to a rate ratio of 1.54 (90% CI 0.24-12.43). Based on modelling of data from the registration cohort, the counterfactual placebo HIV incidence rate was estimated to be 2.59/100 person-years (90% CI 1.86-3.52) (Appendix,p. 2-3);an analysis of incident infections during the post-PrEP phase of the trial produced a slightly lower estimate: 1.56/100 person-years (90% CI 1.13-2.16) (Appendix,p.3). These incidence rates correspond to an expected 9.2 and 5.5 infections per group in the absence of PrEP. The key analysis shows the AIR (and the 90% CI) plotted as a function of the counterfactual placebo incidence rate (Figure 2). This parameter is critical to inference and would need to be greater than 3.4/100 person-years for the lower 5% confidence limit to exceed 50% i.e. allowing a conclusion of non-inferiority. However, both approaches to estimating the counterfactual placebo HIV incidence rate indicate values substantially lower than this. The estimated efficacy of F/TAF ranged from 22% to 75% over the range of plausible values of the counterfactual placebo incidence rate, although with wide CIs (Appendix,p.12). Combining randomised groups and controlling for differences between

sites, the incidence rate during post-study PrEP follow-up was 2.30-fold higher compared with the PrEP phase (90% CI 1.06-5.54, P=0.07).

Table 2 shows details of the 5 participants who experienced the primary efficacy outcome. All 5 participants were cisgender women, and an analysis restricted to this group is given in the Appendix (p.13). At week 8, TFV-DP was below the limit of quantification in the 3 cases in the F/TAF group, while low levels (consistent with <2 tablets per week) were identified in the 2 cases in the F/TDF group. A major resistance mutation (NNRTI-associated, K103N) was identified in one of four participants whose virus was successfully amplified, indicative of transmitted resistance rather than PrEP selection pressure.

In a non-prespecified analysis, we compared the two randomised groups over the entirety of follow-up, including the phase when study PrEP was no longer dispensed (Appendix,p.11). This revealed a higher cumulative HIV incidence in the F/TAF group (hazard ratio=1.88, 90% CI 1.01-3.48, P=0.09), with the difference between the two groups largely emerging in the six month period following the discontinuation of the provision of study PrEP. TFV-DP levels around the time of infection were mostly below the level of quantification, although there was one possible breakthrough infection in the F/TAF group (Appendix,p.9).

The primary safety outcome, a clinical decision to discontinue PrEP for an adverse event considered related to the drug, was not observed, although one participant (F/TDF) interrupted PrEP for a suspected drug reaction that was later identified as an allergy to fish. Serious adverse events during the study PrEP phase were observed in 4 participants (3 F/TAF, 1 F/TDF) none of which were considered related to PrEP (Appendix,p.8).

The mean(SD) number of tablets dispensed per participant was 191(45) in the F/TAF group and 192(49) in the F/TDF group. Most participants were dispensed between 150 and 210 tablets, with some receiving more because of a delay in the third vaccination (Appendix,p.4).

The proportion reporting any PrEP use since the previous visit declined slightly over follow-up but remained above 85% in both groups up to week 26. Slightly over 50% of participants reported using study PrEP between week 26 and week 30, reflecting the availability of left-over tablets. At week 48 (i.e. beyond the study-PrEP phase), 14% and 18% of participants in the F/TAF and F/TDF groups reported having used non-study PrEP since their previous visit, respectively. Condomless sex was common in the study population, being reported by 80-85% of participants within the last 7 days throughout the study PrEP period. The proportion of participants who reported taking at least one PrEP tablet within two days of their last condomless sex act was consistently greater than 80% (Appendix,p.5).

More objective evidence of adherence is provided by the detection of tenofovir (TFV) in urine (reflecting adherence in the previous 2-4 days) and, more reliably, quantitative levels of TFV-DP measured in DBS (reflecting cumulative dosing over the previous 4-8 weeks).[23] The rate of detection of TFV in urine was consistently between 65% and 72% in both randomised groups (Appendix,p.6). Table 3 shows the results of the analysis of TFV-DP levels in the subset of DBS samples at week 8, classified in adherence categories. The active metabolite was quantifiable slightly more often in the F/TDF group (76%) than in the F/TAF group (67%), although a direct comparison of the groups should be made cautiously because of the different extraction methods for the two drugs. However, drug levels were low in most participants, with only 14% of participants classified as taking 2-3 tablets per week and 9% as taking 4 or more tablets per week.

## DISCUSSION

Although similar HIV incidence rates were observed in the F/TAF and F/TDF groups, our study does not demonstrate the non-inferiority of F/TAF. This is likely due to a lack of statistical power for two main reasons. In designing the trial, we had anticipated that the counterfactual placebo HIV incidence would be at least 3/100 person-years (the higher the value, the greater the statistical power), but estimates from the registration cohort and the post-PrEP follow-up phase were both lower than this, 2.59/100 and 1.56/100 person-years, respectively. Also, the AIR is more precisely estimated the higher the level of adherence, specifically whether sufficient PrEP was taken around the time of condomless sex.[24] Based on TFV-DP levels measured in randomly selected DBS samples at week 8, only an estimated 23% of participants were taking ≥2 tablets per week on average and thus achieving meaningful protection. Adherence is likely to have further declined at later timepoints, as observed in the PURPOSE-1 trial.[9]

An unexpected finding was the relatively high HIV incidence in the F/TAF group in the six-month period following the withdrawal of study PrEP. We note that this was not a pre-specified analysis and the difference between the groups is not statistically significant. There is no obvious biological explanation for this effect given that adherence was generally low in both groups and intracellular levels of active drug are insignificant after around 2 weeks of stopping drug (the estimated half-life of TFV-DP in PBMCs is 2.9 days and 2.1 days with F/TAF and F/TDF regimens, respectively).[12]

Our study had several limitations, in addition to the factors relating to the low statistical power discussed above. PrEPVacc was a factorial trial and there was some evidence of a higher risk of HIV infection in those who received active vaccines compared to placebo.[25] This was probably a chance finding, but the comparison of the F/TAF and F/TDF groups will not have been biased in any case as the allocation of the vaccine regimens was balanced across the two regimens. However, if there was a genuine vaccine enhancement effect, then

the estimate of the counterfactual placebo incidence from the registration cohort will be conservatively low. Although TFV-DP is considered the most robust standard for assessing adherence, low adherence (<2 tablets a week) could still be compatible with adherence around condomless sex when this is infrequent, and this pattern of pill taking is known to be highly effective in cismen.[5] Participants were asked about adherence around the time of their most recent condomless sex but, when assessed against TFV-DP levels in DBS, they appear to have over-estimated this. Finally, the third vaccination was delayed in some participants because of supply issues, which meant that follow-up during the study PrEP phase extended beyond the planned 26 weeks and adherence may have declined over time.

Daily F/TAF was shown to be non-inferior to daily F/TDF for HIV prevention in cismen and transgender women.[13, 26] PURPOSE-1 set out to fill the gap for ciswomen by comparing HIV incidence in the intervention arms to the estimated background HIV incidence derived from the screened population, and to HIV incidence in the F/TDF control group.[9] In the F/TAF group, HIV incidence was only slightly lower than background HIV incidence (rate ratio=0.85, 95% CI 0.55-1.28) and slightly higher than the rate in the F/TDF group (rate ratio=1.20, 95% CI 0.67-2.14), representing a failure to demonstrate efficacy and non-inferiority, respectively. However, in a case-control analysis of DBS samples, only 8% (3/37) cases had medium or high levels of TFV-DP compared with 34% of randomly-selected control samples (odds ratio=0.11, 95% CI 0.01-0.49).

The level of adherence to oral PrEP, as measured by TFV-DP levels in plasma or DBS, has ranged widely in trials of women in sub-Saharan Africa, influenced by the specific trial design. The highest rate of 82% was observed in the Partners-PrEP study based on detection of tenofovir in plasma, but participants were highly motivated to take PrEP as their sexual partner was known to be living with HIV.[2] The two trials comparing oral and injectable PrEP (including PURPOSE-1) reported detectable TFV-DP levels of approximately 55-60%, but adherence may have been affected by the double-dummy design.[9, 10] Lower rates were

observed in the FEM-PREP (36%) and VOICE (29%) studies, which compared oral TDF or F/TDF versus oral placebo.[27, 28] PrEPVacc has parallels with the HVTN702 and Mosaico HIV vaccine trials, in both of which PrEP was provided either free as a non-study drug or with support via a local facility.[17, 18] However, in HVTN702 self-reported PrEP use was only 3% and TFV-DP levels compatible with daily dosing were observed in less than 1% of randomly selected DBS samples. Similarly; in Mosaico, the estimated proportion of person-years with effective drug levels was less than 1%.

In summary, the experience from multiple studies indicates that the challenge of identifying a cohort of ciswomen with both sufficiently high HIV incidence and good adherence to demonstrate efficacy of oral F/TAF in a traditional randomised controlled trial may be insurmountable. Further, clinical guidelines in Europe[29] and UK[30] have already accepted the strength of evidence from non-randomised clinical pharmacology and modelling studies supporting the systemic potency of oral F/TAF in preventing HIV infection in all populations.[11, 12, 31] This includes a recent landmark paper concluding that drug concentration in PBMCs rather than local tissue is the primary marker for PrEP efficacy in cisgender women and that hypotheses of a male/female difference in the effect of oral PrEP are not underpinned by clinical data.[24] Notably, F/TAF produces around 7-fold higher levels of TFV-DP in PBMC compared with F/TDF in partially adherent participants, and is likely to be the more potent regimen under irregular patterns of pill taking.[12] Although injectable PrEP is demonstrably more effective than oral PrEP, successful prevention of HIV requires matching individuals with PrEP technologies that fit individual preferences,[32] and F/TAF should be considered as one of these options regardless of sex.

**Figure legends**

**Figure 1**

CONSORT flow diagram

**Figure 2**

AIR related to counterfactual placebo incidence, as estimated from the registration cohort and post-PrEP trial follow-up

Footnote

Black line, point estimate; grey line, lower 5% CL. Horizontal lines show 90% CI for estimated counterfactual placebo incidence.

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**Data Sharing**

The policy of the PrEPVacc Steering Committee is to make de-identified participant data available to any researcher who submits a scientifically robust proposal, provided data exchange complies with information, governance, and data security policies in all the relevant countries.

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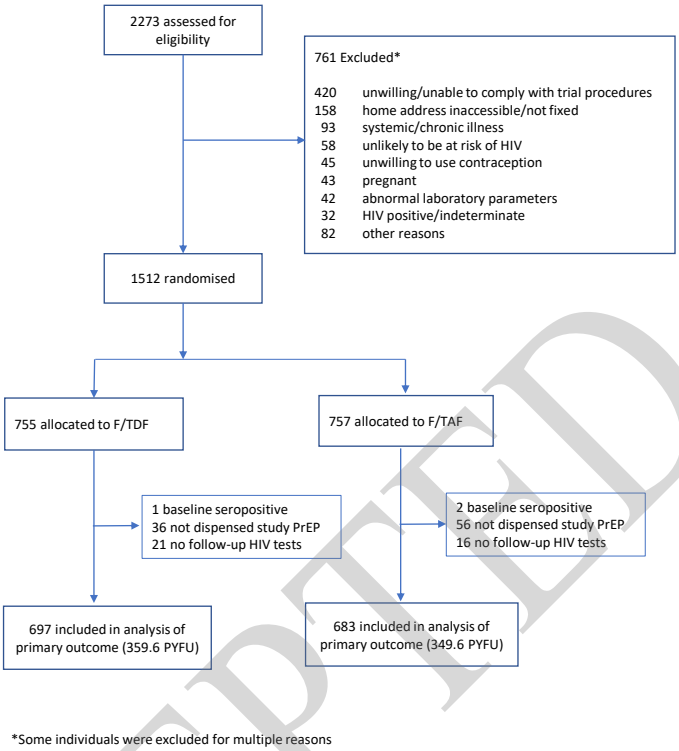


*Some individuals were excluded for multiple reasons

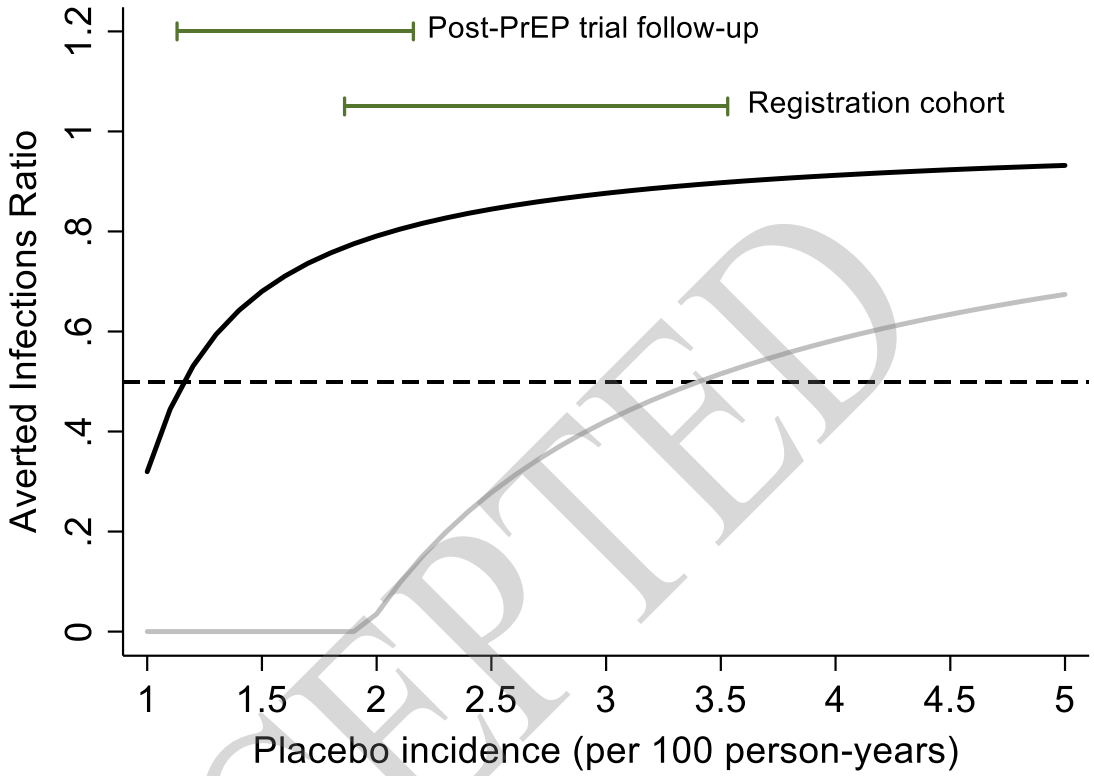

**Table 1. Baseline characteristics of participants included in the primary PrEP analyses**

| | F/TDF (n=697) | F/TAF (n=683) | Total (n=1380) |
|---|---|---|---|
| **Site** | | | |
| Dar es Salaam | 88 (13%) | 90 (13%) | 178 (13%) |
| Masaka | 213 (31%) | 199 (29%) | 412 (30%) |
| Mbeya | 216 (31%) | 217 (32%) | 433 (31%) |
| Verulam | 180 (26%) | 177 (26%) | 357 (26%) |
| **Sex at birth** | | | |
| Male | 92 (13%) | 88 (13%) | 180 (13%) |
| Female | 605 (87%) | 595 (87%) | 1,200 (87%) |
| **Median age, year (IQR)** | 25 (22, 29) | 25 (22, 29) | 25.0 (22, 29) |
| **Enrolled via registration cohort** | 426 (61%) | 423 (62%) | 849 (62%) |
| **Vaccine allocation** | | | |
| DNA AIDSVAX | 283 (41%) | 274 (40%) | 557 (40%) |
| DNA CN54 MVA | 136 (19%) | 129 (19%) | 265 (19%) |
| Placebo | 278 (40%) | 280 (41%) | 558 (40%) |
| **Ever taken PrEP** | 24 (3%) | 27 (4%) | 51 (4%) |
| **Sex worker** | 414 (59%) | 412 (60%) | 826 (60%) |
| **Median condomless sex partners in the last 3m (IQR)** | 4 (2,10) | 4 (2,10) | 4 (2,10) |
| **Diagnosed with STI in last 3 months** | 112 (16%) | 97 (14%) | 209 (15%) |

**Table 2 . Details of the five participants who experienced the primary outcome**

| Group | Virus first detected (weeks) | First detectable viral load (copies/ml) | TFV-DP level (weeks)[1] | Major resistance mutations (weeks) |
|---|---|---|---|---|
| F/TAF | 19 | 94,400 | <8.7 (8), <8.7 (24) | None (25) |
| F/TAF | 20 | 390 | <8.7 (8), <8.7 (20) | NNRTI: K103N (23) |
| F/TAF | 34[2] | 1,600 | <8.7 (8), <8.7 (26) | None (40) |
| F/TDF | 16 | 17,100 | 71 (8), <8.7 (26) | Did not amplify (26) |
| F/TDF | 25 | 65,900 | 142 (8), 60 (26) | None (29) |

1. fmol per single 3mm punch (F/TDF),  fmol per two 7mm punches (F/TAF)
2. a participant whose third vaccination was delayed

**Table 3. TFV-DP levels in DBS sample at week 8 and inferred adherence**

| Adherence (tablets/week) | F/TDF | | F/TAF | | Overall |
|---|---|---|---|---|---|
| | TFV-DP level[1] | n (%) | TFV-DP level[2] | n (%) | n (%) |
| Low (<2) | <8.7 | 70 (24) | <8.7 | 91 (32) | 161 (28) |
| | 8.7-349 | 157 (54) | 8.7-449 | 117 (42) | 274 (48) |
| Medium (2-3) | 350-699 | 41 (14) | 450-949 | 43 (15) | 84 (14) |
| High (≥4) | ≥700 | 22 (8) | ≥950 | 29 (10) | 51 (9) |
| Total | | 290 (100) | | 280 (100) | 570 (100) |

1. fmol per single 3mm punch
2. fmol per two 7mm punches
Lower limit of quantification = 8.7 fmol for both drugs
See Appendix for details of assay and references for adherence classification