

Adherence to pre-exposure prophylaxis among young, pregnant and lactating women in Eswatini



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Background

- Pre-exposure prophylaxis (PrEP) is a biomedical HIV prevention method and its effectiveness of preventing HIV infection depends on medication adherence.
- In Eswatini, in a pilot study of PrEP, tenofovir disoproxil fumarate (TDF) was used as an active component of the PrEP medication together with lamivudine (3TC).
- We identified adherence level of PrEP in women by quantifying intracellular tenofovir-diphosphate (TFV-DP) concentration in blood.

Methods

- Between September 2017 to June 2019, TDF+3TC was offered to HIV negative adults (>16 years) targeting young (16-25 years), pregnant and lactating women, HIV negative persons of sero-discordant relationships, and people with sexually transmitted infections.
- Venous blood was collected from a sub-cohort of young, pregnant, and lactating women to prepare DBS (dried blood spot) cards at 3 months, 6 months and every 6 months thereafter until they followed up and stored at -20°C.
- At the end of study, a random sub-sample of 34 participants (10% of estimated sub-cohort) were selected to measure TFV-DP in blood.

- The TFV-DP concentrations were classified as follows ^{1, 2} –

fmol/punch	Adherence level
< 132	Low (<2 doses/week)
132 – 384	Moderate (2 – 4 doses / week)
> 384	Good (>4 doses /week)

- Level of >504 fmol/punch was suggestive of perfect adherence (7 doses/week).

1. Anderson, P. L. et al. Emtricitabine-tenofovir exposure and pre-exposure prophylaxis efficacy in men who have sex with men. *Sci Transl Med* 4, 151ra125 (2012).
2. Castillo-Mancilla, J. R. et al. Tenofovir, Emtricitabine, and Tenofovir Diphosphate in Dried Blood Spots for Determining Recent and Cumulative Drug Exposure. *AIDS Res Hum Retroviruses* 29, 384–390 (2013).

Results

- Among 283 sub-cohort of PrEP users; 131 were pregnant, 64 lactating and 88 were young women (neither pregnant nor lactating). (Fig 1)
- Majority of women perceived themselves at risk of HIV acquisition. (Fig 2)

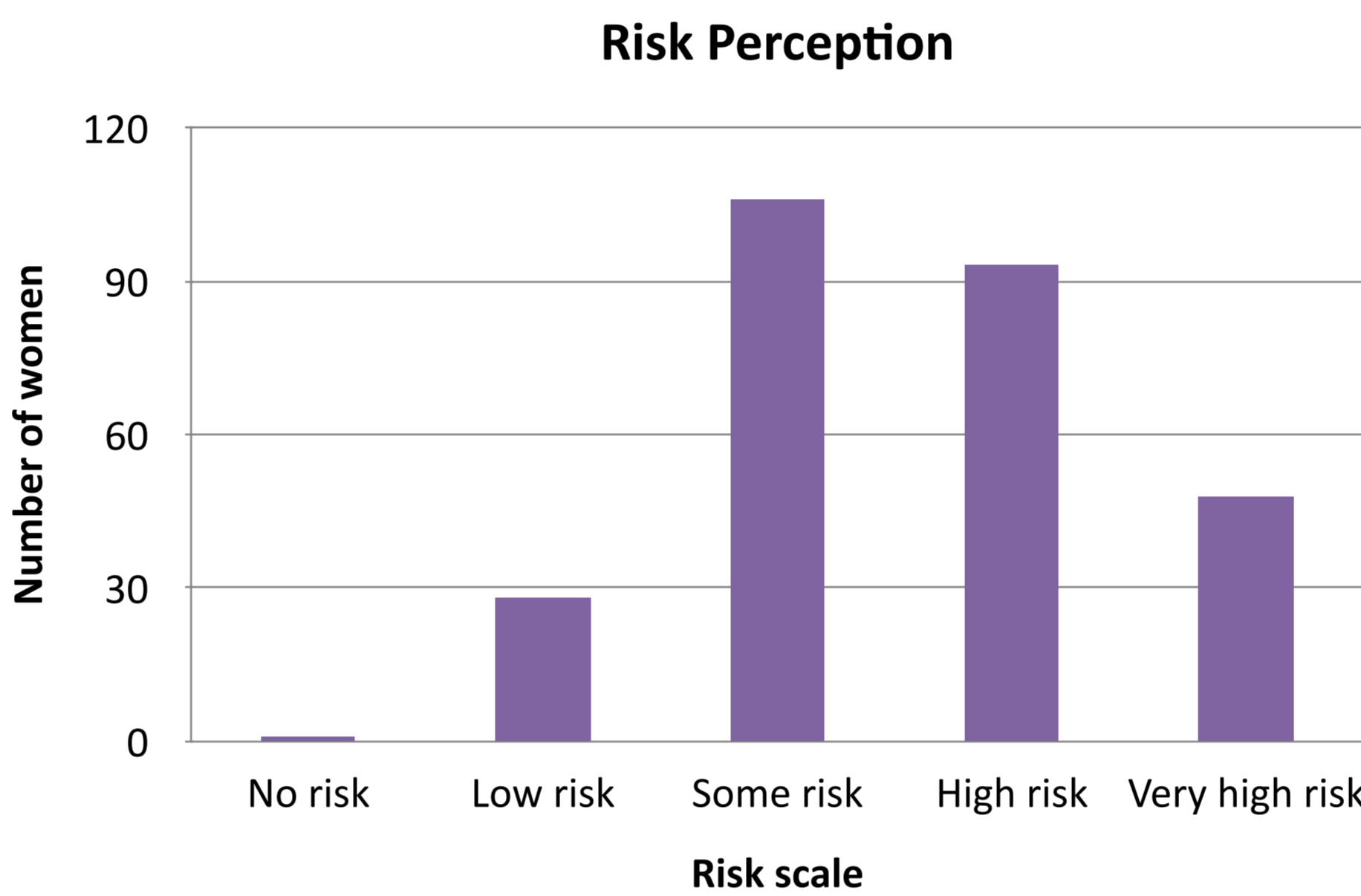


Fig 2: Self-perceived risk scale of women taking PrEP

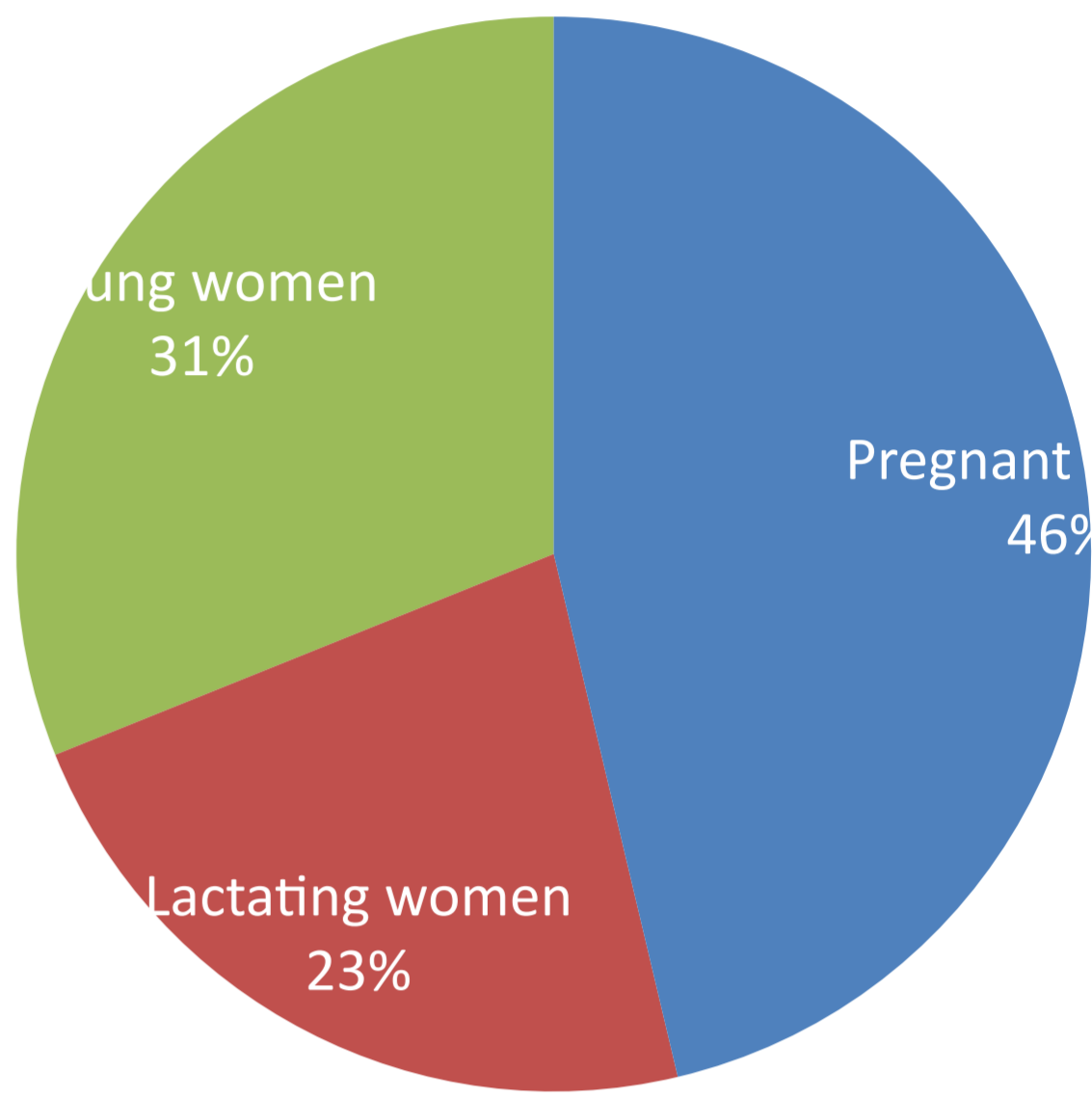


Fig 1: Distribution of target women in the study.

- In the 34 participants, the median concentration of TFV-DP was 516 fmol/punch (IQR 346 – 725) in 3 months DBS samples.
- Among them, 5 (15%) had TFV-DP concentration <132 fmol/punch, 7 (20%) between 132 – 384, and 22 (65%) had >384 fmol/punch suggesting low, moderate and good level of adherence respectively. (Fig 3)
- Out of 22 with good adherence, 14 had TFV-DP concentration of >504 fmol/punch, indicating a perfect adherence of 7 doses a week.
- Among the 34 participants, 15 people had 6 months follow-up samples with median TFV-DP concentration of 532 fmol/punch (IQR 409 – 767), and only 5 people had 12 months follow-up samples with median TFV-DP of 753 fmol/punch (IQR 675 – 807). (Fig 4)

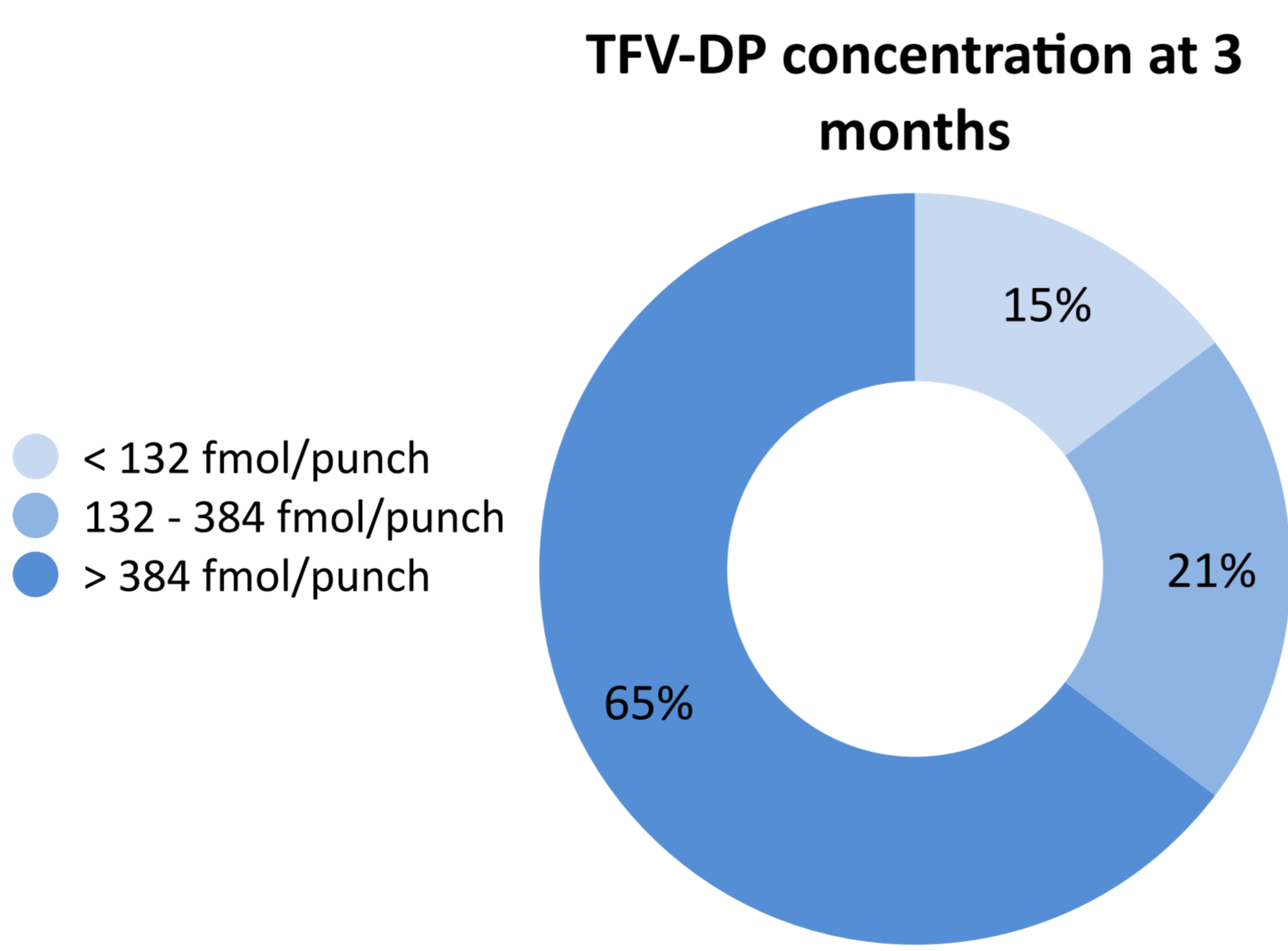


Fig 3: TFV-DP concentration to monitor adherence level

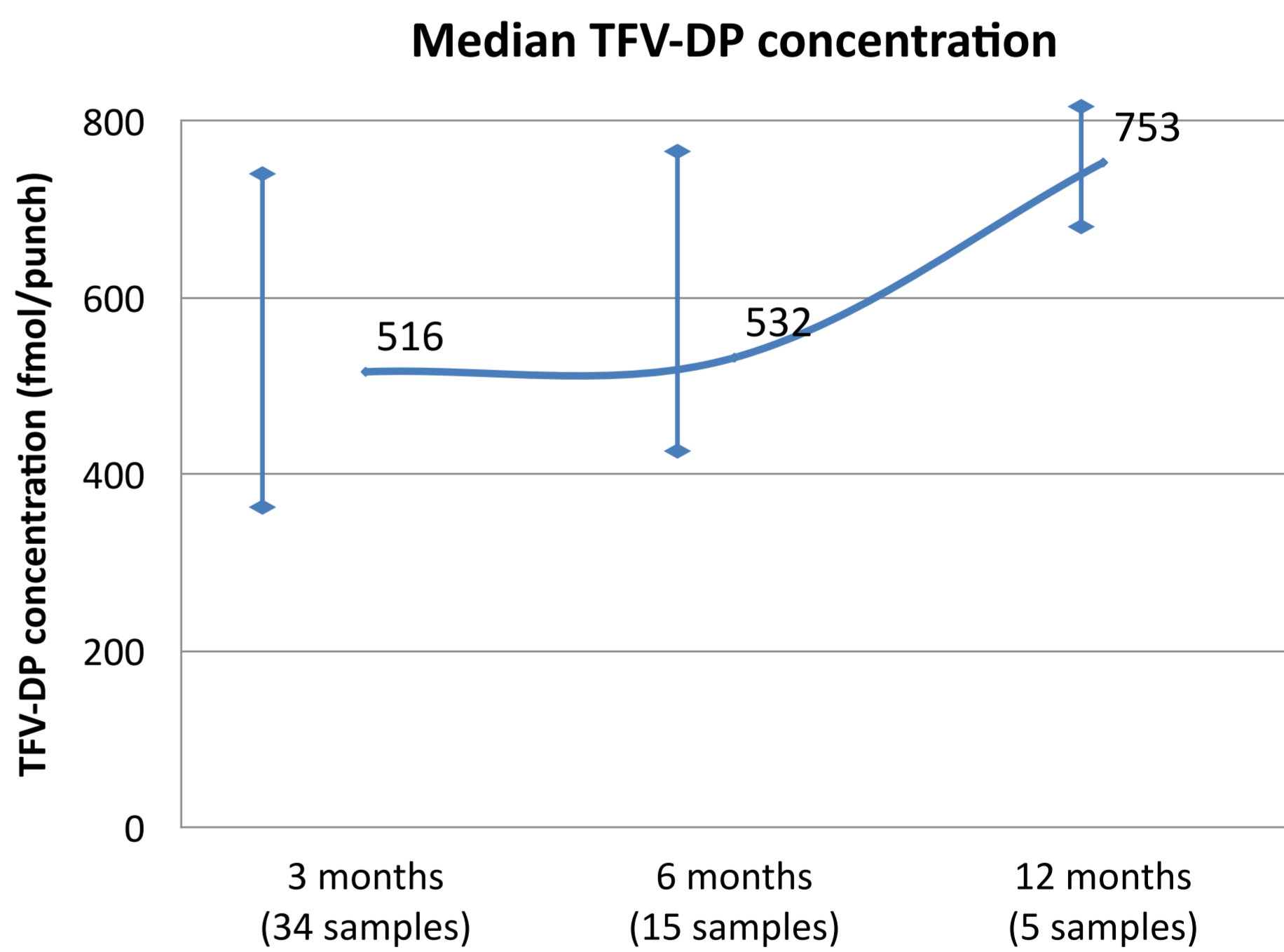


Fig 4: Median TFV-DP concentration over time among the 34 participants. Note: loss to follow-up/number of samples.

Conclusion

- The median tenofovir-diphosphate concentration was high among the participants at 3 months. It remained high in participants who followed up, however we found many people lost to follow-up by 12 months.
- Although no sero-conversion occurred, a few people were observed with very low TFV-DP concentration indicating low level of adherence to reach desired PrEP efficacy, highlighting the need for proper adherence assessment in such program.

Acknowledgements

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