

## HIGHER INCOME INEQUALITY IS ASSOCIATED WITH LOWER CUMULATIVE ANTIRETROVIRAL ADHERENCE

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**Background:** Tenofovir diphosphate (TFV-DP) in dried blood spots (DBS) is associated with viral suppression and predicts future viremia. However, its association with the social determinants of health (SDoH) in people living with HIV (PLWH) has not been evaluated.

**Methods:** DBS for TFV-DP were prospectively collected from a clinical cohort of PLWH receiving tenofovir disoproxil fumarate (TDF)-based therapy (up to 3 visits over 48-weeks between 2014 and 2017). Zip code was collected at enrollment and matched with the relevant SDoH data from 2016 obtained from AIDSVu (aidsvu.org). SDoH data included household income, percent living in poverty, education level and income inequality (the latter was quantified using the Gini coefficient, where 0 and 1 represent absolute income equality and inequality, respectively). Log-transformed TFV-DP concentrations were analyzed using a mixed-effects model. Baseline statistics are presented as median (interquartile range). Model results are percent change [95% confidence interval] in TFV-DP for every significant change in the SDoH. All results are reported with no adjustment for multiple comparisons.

**Results:** A total of 950 person-visits from 430 participants were analyzed, encompassing zip codes within the following Colorado counties: Denver, Arapahoe, Jefferson, Adams and Douglas. Baseline household income, Gini and TFV-DP concentration were \$56,227 (\$46,763, \$70,369), 0.418 (0.391, 0.487) and 1721 (1181, 2441) fmol/punch, respectively. After adjusting for age, sex, race, estimated glomerular filtration rate, body mass index, hematocrit, CD4+ T-cell count, antiretroviral drug class and 3-month self-reported adherence, Gini was inversely associated with TFV-DP in DBS. For every 0.1 increase in Gini, TFV-DP concentration decreased by 9.2% [0.5, 17.1%; P=0.039]. Gini remained significant after adjusting for HIV viral suppression with the same 0.1 increase estimating a decrease of 8.7% [0.3 17.9%; P=0.042] in TFV-DP concentrations. No statistically significant associations were identified between TFV-DP concentration and the other SDoH (Table).

**Conclusions:** Greater income inequality was associated with lower TFV-DP concentrations in PLWH on TDF, suggesting that adherence may be influenced by population level characteristics that exist in the presence of income inequality and impact individual level health outcomes. Future studies on the utility of this adherence biomarker to improve clinical care and adherence in marginalized PLWH are needed.

Table. Percent change in TFV-DP concentration in DBS (fmol/punch) for every change in the social determinant of health.

Social Determinant	Adjusted*		
	Percent change in TFV-DP concentration in DBS (fmol/punch)	95% CI	p-value
0.1 increase in Gini coefficient	-9.2%	(-17.1, -0.5%)	0.039
10% increase in persons living in poverty	1.9%	(-6.0, 10.5%)	0.65
10% increase in persons with high school diploma or equivalent	-3.5%	(-8.8, 2.1%)	0.22
\$10,000 increase in median household income	-0.2%	(-3.3, 3.0%)	0.90

\*Adjusted for age, sex, race, estimated glomerular filtration rate, body mass index, hematocrit, CD4<sup>+</sup> T cell count, antiretroviral drug class, and 3-month self-reported adherence.