# Detectable viraemia among pregnant women on antiretroviral therapy initiating antenatal care: implications for prevention of mother-to-child HIV transmission (Poster 874)

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## Background

- With significant increases in antiretroviral therapy (ART) uptake across sub-Saharan Africa, a growing number of HIV+ women conceive and initiate antenatal care already on ART
- However services for preventing mother-to-child transmission (PMTCT) of HIV typically focus on (i) identifying HIV+ women and (ii) initiating antiretroviral regimens in pregnant women who are not already on ART
- In most services, women conceiving on ART are presumed to be virally suppressed throughout pregnancy, and thus at minimal risk of vertical HIV transmission, yet there are few data on viraemia in pregnancy in women conceiving on ART in African settings
- We examined the prevalence and predictors of viraemia in women entering PMTCT services already on ART in Cape Town, South Africa

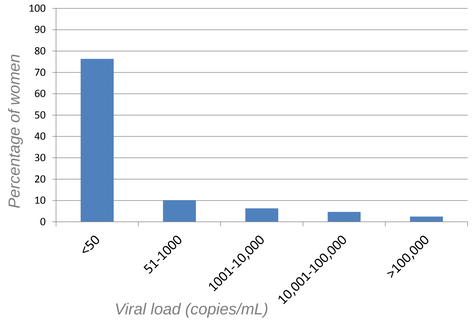
## Methods

- Working in a large primary care antenatal clinic (ANC) in Gugulethu, Cape Town, we conducted a cross-sectional study of consecutive HIV+ pregnant women who had started ART before conception
- We examined the prevalence of viraemia, defined in separate analyses as >50 copies/mL (Abbott RealTime HIV-1) and >1000 copies/mL (as vertical transmission risk increases above this level)
- Demographic, clinical and behavioral factors associated with viraemia were identified using Fisher's exact tests or ranks-sum tests; independent predictors were examined using multiple logistic regression

## Results

- From 1 April 2013 to 31 Jan 2014, n=1034 HIV+ women presented for their antenatal visit and entered PMTCT services; of these, n=364 (35%) initiated ART prior to conception (median age, 31years; IQR: 27-34)
- Median duration of ART use was 2.7 years (IQR, 1.4-5.1; minimum, 4 months); 7% reported at least 3 missed ART doses in the past 30 days
- 50% of all women reported using TDF-3TC-EFV; 18% reported TDF-3TC-NVP; 20% were using an AZT or D4T containing regimen; and 12% were using a PI-based regimen

**Figure 1: Distribution of plasma viral load among women on ART at entry into PMTCT services**




- 76% of women (n=278) on ART had viral loads <50 copies/mL at their first antenatal visit (Figure 1)
- Of the 24% of women with detectable viral loads (n=86), the majority (13%, n=49) had values >1000 copies/mL (95% CI, 10%-17%)

**Table 1: Factors associated with categories of plasma viral load**

| | Viral load <50 copies/mL | | Viral load 51-1000 copies/mL | | Viral load >1000 copies/mL | | global p-value |
|---|---|---|---|---|---|---|---|
| | *n* | *% or IQR* | *n* | *% or IQR* | *n* | *% or IQR* | |
| **Number of women** | 278 | 76 | 37 | 10 | 49 | 13 | |
| **Median age** | 31 | 28-35 | 32 | 32-35 | 30 | 28-34 | 0.193 |
| **Median gravidity** | 3 | 2-3 | 3 | 2-3 | 3 | 2-3 | 0.728 |
| **Median gestation** | 19 | 11-25 | 12 | 7-20 | 18 | 10-24 | 0.021 |
| **Level of education** | | | | | | | |
| **Primary** | 12 | 4 | 0 | - | 2 | 4 | 0.603 |
| **Secondary** | 261 | 94 | 36 | 97 | 47 | 96 | |
| **Tertiary** | 5 | 2 | 1 | 3 | 0 | - | |
| **Employed** | 109 | 39 | 11 | 30 | 17 | 35 | 0.482 |
| **Relationship status: Married/cohabiting** | 141 | 51 | 23 | 62 | 14 | 29 | 0.004 |
| **Not married/cohabiting** | 137 | 49 | 14 | 38 | 35 | 71 | |
| **Disclosed to partner** | 230 | 83 | 31 | 89 | 39 | 81 | 0.687 |
| **Median duration of ART use (years)** | 2.42 | 1.34-4.93 | 3.16 | 2.21-6.22 | 3.13 | 1.69-5.12 | 0.105 |
| **Currently using PI-based regimen** | 14 | 9 | 5 | 29 | 6 | 21 | 0.019 |
| **Self-rated adherence in previous 30 days: *Very good* or *Excellent*** | 127 | 53 | 11 | 33 | 16 | 37 | 0.024 |
| **Missed ≥1 doses in past 30 days** | 48 | 20 | 8 | 24 | 18 | 42 | 0.011 |
| **Missed ≥2 doses in past 30 days** | 33 | 14 | 4 | 12 | 15 | 35 | 0.005 |
| **Missed ≥3 doses in past 30 days** | 14 | 6 | 1 | 3 | 8 | 19 | 0.018 |

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- Missing ≥1, ≥2 and ≥3 doses in the previous 30 days was 42%, 35% and 19% sensitive, and 79%, 86% and 94% specific, respectively, in detecting VL >1000
- In crude analyses (Table 1): being married/cohabiting and having good self-rated ART adherence were associated with undetectable VL; current use of a PI-based regimen and reporting missed ART doses in the previous 30 days were associated with detectable VL

**Table 2: Logistic regression models predicting relative odds (RO) with 95% confidence intervals (CI) of VL>1000 copies/mL vs VL <50 copies/mL, among women starting antenatal care on ART**

| | Univariable | | | Multivariable | | |
|---|---|---|---|---|---|---|
| | *RO* | *95% CI* | *p-value* | *RO* | *95% CI* | *p-value* |
| **Age (years)** | 0.96 | 0.90-1.02 | 0.170 | 0.94 | 0.87-1.02 | 0.123 |
| **Gestation (weeks)** | 0.99 | 0.96-1.02 | 0.570 | | | |
| **Married/cohabiting (vs not)** | 0.40 | 0.21-0.79 | 0.008 | 0.44 | 0.21-0.92 | 0.030 |
| **Duration of ART use (years)** | 1.11 | 0.99-1.25 | 0.081 | 1.13 | 0.98-1.31 | 0.089 |
| **Currently on PI-based regimen (vs NNRTI-based regimen)** | 1.66 | 0.98-2.83 | 0.060 | | | |
| **Self-rated adherence in previous 30 days: *Very good* or *Excellent* (vs other)** | 0.50 | 0.26-0.98 | 0.045 | | | |
| **Missed 3+ doses in past 30 days (vs missed ≤2 doses)** | 3.87 | 1.49-10.00 | 0.005 | 3.09 | 1.16-8.22 | 0.024 |

- In a mutivariable logistic regression model (Table 2), being married/cohabiting was inversely associated, and reported missed ≥3 doses in the previous 30 days was positively associated, with VL>1000 copies/mL

## Conclusions

- These data demonstrate a surprisingly high prevalence of detectable viraemia among HIV+ pregnant women entering PMTCT services already on ART (13% of women with VL>1000 copies/mL)
- With increasing numbers of HIV+ women of reproductive age receiving lifelong ART (more than one-third in this setting) there is an urgent need to investigate the causes of viraemia in this group, and in turn develop strategies to identify these women and intervene to reduce VL rapidly for PMTCT