

Spatiotemporal Variation and Predictors of Unsuppressed Viral Load Among HIV Positive Men and Women in Rural and Peri-urban KwaZulu-Natal, South Africa

Authors

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Table S1: Characteristics of enrolled HIV positive men and women with viral load measurement in Vulindlela (rural) and Greater Edendale (peri-urban) area in the uMgungundlovu district, KwaZulu-Natal province, South Africa

Characteristics	Study sample (N= 7824) n (%)
Socio-demographic	
<i>Median age [IQR]</i>	33 (27-39)
<i>Median household size [IQR]</i>	4 (2-6)
<i>Study year</i>	
2014 survey	3956 (50.6%)
2015 survey	3868 (49.4%)
<i>Gender</i>	
15-19	337 (4.3%)
20-24	929 (12.1%)
25-29	1484 (18.7%)
30-34	1669 (21.3%)
35-39	1415 (19.1%)
40-44	1211 (15.1%)
45-49	779 (9.4%)
<i>Gender</i>	
Women	5893 (64.5%)
Men	1931 (35.5%)
<i>Marital status</i>	
Never married	6479 (83.8%)
Ever married	1345 (16.2%)
<i>Education level</i>	
Incomplete High School	4366 (57.6%)
Complete High School	3231 (40.3%)
No Schooling	227 (2.1%)
<i>Duration in the community</i>	
Always	5088 (66.8%)
Moved in less than 1 year ago	266 (3.0%)
Moved in more than 1 year ago	2470 (30.2%)
<i>Away from home for >1 month</i>	
Yes	714 (9.3%)
No	7110 (90.7%)
<i>Run out of money last 12 months ^A</i>	
Yes	2917 (38.9%)
No	4893 (61.1%)
<i>Had meal cut last 12 months ^C</i>	
Yes	2598 (34.9%)
No	5212 (65.1%)
<i>Accessing health care ^D</i>	
Yes	4395 (58.3%)
No	3415 (41.7%)
<i>Monthly household income ^E</i>	
>R2 500	1836 (26.6%)
≤R2 500	5039 (63.0%)
No income	939(10.4%)
<i>Place of residence</i>	
Rural	2606 (46.8%)
Peri-urban	5222 (53.2%)
Behavioral	
<i>Median number of sex partner last 12 months [IQR]</i>	1 [1-2]
<i>Median number of lifetime sex partner [IQR]</i>	3 [2-5]
<i>Had sex in last 12 months</i>	
Yes	6306 (81.4%)
No	1518 (18.6%)
<i>Forced sex first time</i>	

Yes	182 (2.1%)
No	7552 (96.6%)
Don't remember	90(1.3%)
Alcohol consumption	
Yes	1928 (27.8%)
No	5896 (72.2%)
HIV perception and knowledge	
<i>Number of lifetime HIV test (median [IQR])</i>	2 [1-3]
Ever tested for HIV	
Yes	6959 (89.6%)
No	865 (10.4%)
Perceived risk of contracting HIV	
Likely to acquire HIV	1476 (19.9%)
Not likely to acquire HIV	1571 (19.8%)
Already infected	4777 (60.3%)
Medical history	
Ever tested for TB	
Yes	3862 (52.1%)
No	3962 (47.9%)
Exposed to TB last 12 months	
Yes	364 (5.0%)
No	7442 (94.9%)
Don't want to disclose	18 (0.1%)
Ever diagnosed with TB	
Yes	959 (14.1%)
No	6865 (85.9%)
On medication to prevent TB	
Yes	808 (10.4%)
No	7016 (89.6%)
Ever had any STI symptoms	
Yes	306 (3.3%)
No	7518 (96.7%)
Ever diagnosed with STI	
Yes	743 (10.7%)
No	7081 (89.3%)
Biological	
On ART	
Yes	3942 (50.8%)
No	3882 (49.2)
ARV dosage^F	
Fixed/single dose	3334 (87.2%)
Multiple	481 (12.7%)
No response	127 (0.03%)
CD4 cell count^G	
< 350 cells/ μ L	2097 (27.7%)
350 – 499 cells/ μ L	1697 (22.1%)
\geq 500 cells/ μ L	3990 (49.7%)

Missing data for; A, B, C, D, =14 ; E 10 , F 127 , G 40 ; IQR = Interquartile range .

Missing data excluded from percentage calculation. ZAR= South African Rands (ZAR 15 ~US\$1)

Ever had any STI symptoms = any symptoms of abnormal vaginal discharge, burning or pain when passing urine, or presence of any genital ulcers/warts

Table S2: Bivariate Survey logistics regression model examining predictors of unsuppressed HIV viral load among HIV positive men and women in Vulindlela (rural) and Greater Edendale (peri-urban) area in the uMgungundlovu district, KwaZulu-Natal province, South Africa

Characteristics	Unadjusted OR (95% CI)	P-value
Socio-demographic		
Year (ref: 2014)		
2015	0.70 (0.63 – 0.78)	<0.0001*
Gender (ref: female)		
Male	1.66 (1.48 - 1.85)	<0.0001*
Age group (ref: 15-19)		
20-24	1.16 (0.85 - 1.59)	0.352
25-29	0.67 (0.51 - 0.89)	0.005*
30-34	0.46 (0.35 -0.60)	<0.0001*
35-39	0.31 (0.23 -0.41)	<0.0001*
40-44	0.30 (0.23 -0.41)	<0.0001*
45-49	0.25 (0.18 - 0.34)	<0.0001*
Education level (Ref: Complete high schooling)		
Incomplete High schooling	0.81 (0.72 - 0.90)	<0.0001*
Away from home more than 1 month (Ref: No)		
Yes	1.41 (1.17 - 1.70)	<0.0001*
Community duration (ref: Always)		
Moved here less than 1 year ago	1.07 (1.43 -0.66)	0.664
Moved here more than 1 year ago	0.77 (0.69 - 0.87)	<0.0001*
Marital Status (ref: Ever married)		
Never married	1.63 (1.38 - 1.92)	<0.0001*
Enumeration area (Ref: Rural)		
Peri-urban	1.08 (0.96 - 1.23)	0.206
Ran out of money last 12 months (Ref: No)		
Yes	0.88 (0.79 - 0.98)	0.026*
Had meal cut last 12 months (Ref: No)		
Yes	0.87 (0.78 - 0.98)	0.024*
Accessing health care (Ref: Yes)		
No	1.66 (1.48 - 1.86)	<0.0001*
Income (Ref: >R2500)		
≤ R2500	1.08 (0.96 - 1.21)	0.190
No income	1.25 (1.04 - 1.49)	0.018
Sexual behavioral		
Had sex in last 12 months (Ref: Yes)		
No	0.89 (0.78 - 1.01)	0.077
Number of sex partner last 12 months (Ref: 0 partner)		
1 partner	1.01 (0.89 - 1.15)	0.838
2 or More partners	1.56 (1.26 -1.92)	<0.0001*
Number of lifetime sex partner (Ref: 0-1 partner)		
2 or more partners	0.75 (0.64 - 0.89)	< 0.0001*
Forced sex first time (Ref: No)		
Yes	0.89 (0.64 - 1.23)	0.471
Don't remember	1.53 (1.23 - 1.91)	<0.0001*
Alcohol consumption (Ref: No)		
Yes	1.78 (1.58 - 2.00)	<0.0001*
HIV perception and testing knowledge		

Ever tested for HIV (Ref: Yes)		
No	3.54 (2.84 - 4.42)	<0.0001*
Number of lifetime HIV test (Ref: 2 or more times)		
1 time	0.84 (0.74 - 0.95)	0.005*
Never	3.36 (2.68 - 4.20)	<0.0001*
Knowledge of HIV status (Ref: Positive)		
Negative	6.28 (5.52 - 7.15)	<0.0001*
Perceived risk of contracting HIV (Ref: Already infected)		
Likely to Acquire HIV	5.27 (4.51 - 6.16)	<0.0001*
Not likely to Acquire HIV	6.36 (5.45 - 7.43)	<0.0001*
Medical history		
Ever tested for TB (Ref: No)		
Yes	0.34 (0.31 - 0.38)	<0.0001*
Exposed to TB last 12 months (Ref: No)		
Yes	0.78 (0.61 - 1.00)	0.053*
Ever Diagnosed with TB (Ref: No)		
Yes	0.43 (0.36 - 0.51)	<0.0001*
On TB medication (Ref: No)		
Yes	0.30 (0.24 - 0.36)	<0.0001*
Ever had any STI symptoms (Ref: No)		
Yes	0.92 (0.71 - 1.20)	0.533
Ever diagnosed with STI (Ref: No)		
Yes	1.18 (0.99 - 1.42)	0.070
Biological		
On ARV (Ref: Yes)		
No	16.57 (14.43 - 19.02)	< 0.0001*
ARV dosage (Ref: Fixed dosage)		
Multiple dosage	2.72 (2.10 - 3.52)	<0.0001*
CD4 count category (Ref: <350 cells/μL)		
350-499 cells/ μ L	0.40 (0.34 - 0.47)	<0.0001*
\geq 500 cells/ μ L	0.21 (0.18 - 0.24)	<0.0001*

*Significant at 5% level of significance. IQR = Interquartile range. OR= Odds Ratio. CI= Confidence Interval
ZAR= South African Rands (ZAR 15 ~US\$1). Ever had any STI symptoms = any symptoms of abnormal vaginal discharge burning or pain when passing urine, or presence of any genital ulcers/warts

Table S3. Values of model comparison measures, DIC.

Parameters	GAM	Structured	Unstructured
DIC	6410.15	5903.19	5894.51
pD	63.93	77.69	81.45

DIC: Deviance Information Criteria. pD: effective numbers of parameters.

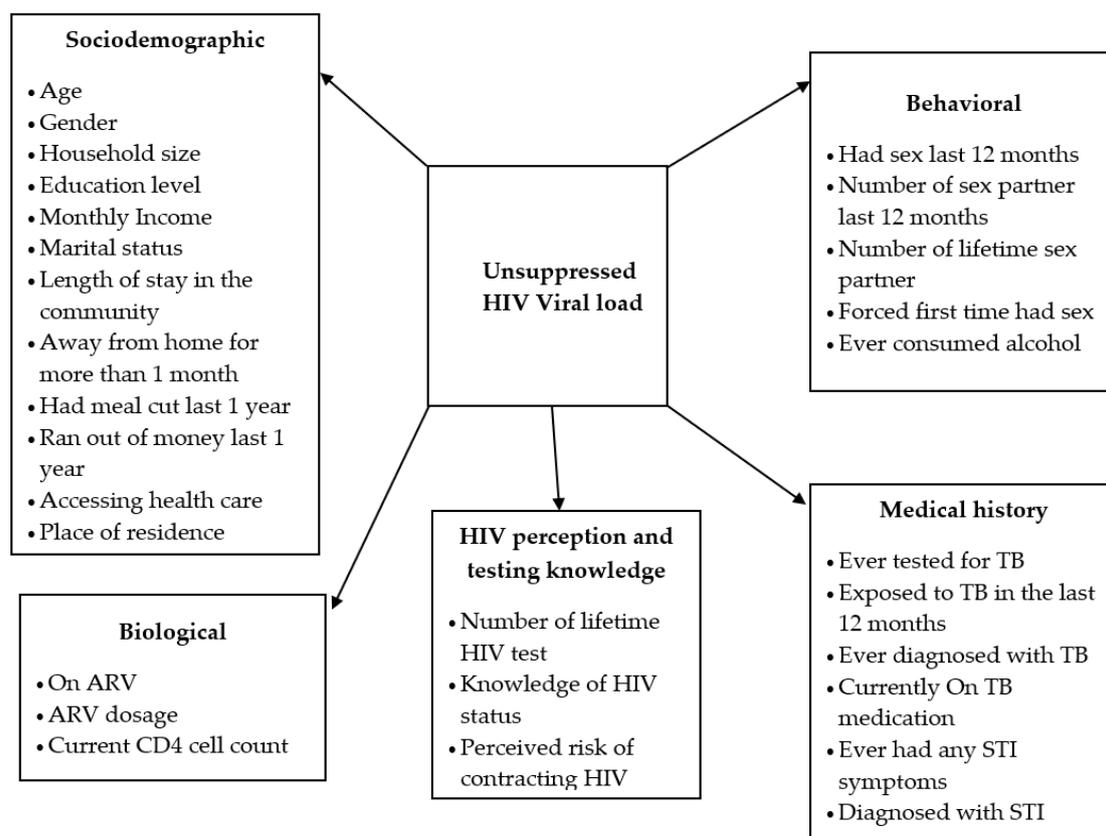


Figure S1: Potential predictors of unsuppressed HIV viral load

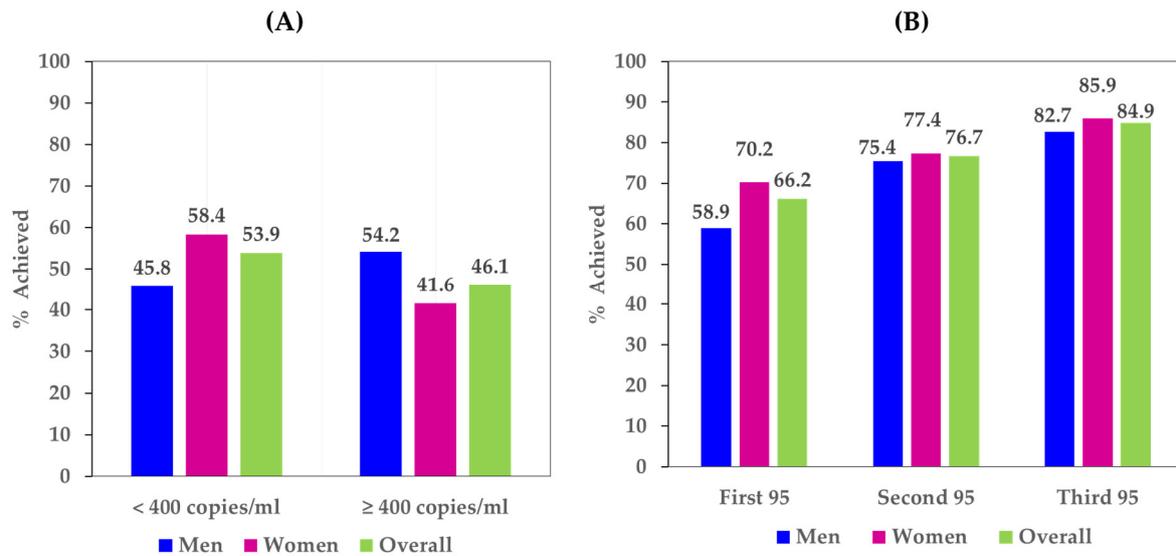


Figure S2: (A) Prevalence of composite HIV viral load <400 copies/ml (suppressed) and ≥400 copies/ml (unsuppressed by gender and overall, among HIV positive men and women. **(B)** Progress towards UNAIDS 95-95-95 targets by gender and overall. First 95: Proportion of HIV positive individuals who knew their status. Second 95: Proportion of HIV positive individuals who knew their status and self-reported to be on ART; Third 95: Proportion of HIV positive individuals who knew their status, self-reported to be on ART and had HIV viral load < 400 copies/ml.