Appendix A: Univariable (unadjusted) analyses of baseline variables and time-dependent variables on time to HIV diagnosis stratified by clinical research center.

This analysis is based on 2,017 visits of 327 MSM at which HIV testing occurred. Although the enrolling CRC was not associated with incident HIV (p=0.21), we stratified our analysis by research center to allow the underlying hazard of infection to vary by CRC due to unmeasured potential confounders. Age, years of education, genital sores, anal sex, been paid for sex, paid for sex, and having received an injection were considered further in multivariable analysis. We did not assess report of oral sex in multivariable analysis as these data were not collected at both Kenyan CRCs. However, it did appear as though volunteer report of giving oral sex to one's partner (placing the partner's penis in the volunteer's mouth) was associated with an increased likelihood of acquiring HIV in Nairobi (p=0.02).

The unadjusted analysis of age at enrollment suggested that younger men were at a greater risk of HIV infection (p=0.19) with borderline significance to include in the multivariable model. In an adjusted analysis, however, age was not a significant predictor as younger men were more likely to report only receptive anal sex. At approximately 25% of the visits, MSM were not asked about recent STI (typically an interim visit); missing data for genital sores appeared to be associated with incident HIV infection, but was of borderline significance. In the adjusted analysis, however, missing data for genital ulcers became a statistically significant predictor of incident HIV (p=0.03, Table 4).

Report of any injection in the last three months was associated with risk of HIV infection in the unadjusted analyses. However, report of any injection was missing for 44% of the visits, and was also strongly associated with report of genital sores with men who reported sores more likely to report an injection (p=0.002), and the data for both injection and genital sores were sparse. Receipt of injection was reported at only 63 visits (with

five cases of HIV at those visits), while report of genital sores in the past 3 months was reported at 74 visits (with 7 cases of HIV at those visits). Because of the level of missing data, the degree of sparse data, and the collinearity between these two variables, report of an injection was omitted from the final model. Report of four or more new partners in the past four weeks was of borderline significance when compared to no new partners (p=0.88), only one HIV infection was observed in the 197 MSM who reported this number of partners, and it was not possible to analyze this further. Being paid for sex was also of borderline significance to be included in multivariable analysis (p=0.12), but was not a significant predictor of incident HIV in multivariable analysis.

Baseline variables report of sex work at enrollment, circumcision status (only 10% of MSM were uncircumcised) and marital status were not associated with an increased risk of HIV acquisition among Kenyan MSM. The complete list of factors assessed is shown in Table A1.

Table A1. Univariable (unadjusted) hazard ratios (HR) and 95% confidence intervals (CI) for potential predictors of incident HIV among MSM (n=327)

Predictor	N*	HIV	HR	95% CI(HR)	p-value
Baseline variables					
Enrollment research center (Stratification variable)					
Nairobi	73	11	Ref.		
Kilifi	254	28	0.64	(0.31, 1.29)	0.208
Age at enrollment					
> 25 years	152	14	Ref.		
≤25 years	175	25	1.55	(0.80, 3.00)	0.190
Circumcision status					
Not circumcised	28	2	Ref.		
Circumcised	295	37	1.72	(0.41, 7.15)	0.455
Years of education					
0 – 8	94	13	Ref.		
9 – 12	83	13	1.04	(0.46, 2.37)	0.923
13 – 16	88	6	0.31	(0.12, 0.82)	0.019

≥ 17	62	7	0.45	(0.18, 1.14)	0.092
Marital status					
Single	263	36	Ref.		
Divorced or Separated	38	0	-		
Married, monogamous	24	3	0.82	(0.25, 2.68)	0.746
Married, polygamous	0	0	-		
Widowed	2	0	-		
Sex worker					
No	55	6	Ref.		
Yes	272	33	1.14	(0.47, 2.78)	0.776
Time dependent variables					
Urethral discharge in last 3 months					
No	1,241	25	Ref.		
Yes	31	1	1.93	(0.25,14.73)	0.528
Missing	745	13	1.10	(0.44, 2.78)	0.835
Dysuria in last 3 months					
No	1,225	26	Ref.		
Yes	41	0	-		
Missing	751	13	1.01	(0.40, 2.51)	0.992
Genital sores in last 3 months					
No	1,545	24	Ref.		
Yes	74	7	7.79	(3.20, 18.97)	< 0.001
Missing	398	8	2.58	(0.92, 7.22)	0.071
Total number of partners in last 4 weeks					
0 – 1	291	8	Ref.		
2 – 3	311	8	1.06	(0.39, 2.84)	0.913
4 – 6	257	5	0.74	(0.24, 2.29)	0.600
≥ 7	280	4	0.54	(0.16, 1.83)	0.321
Missing	878	14	0.63	(0.22, 1.79)	0.383
Number of regular partners in last 4 weeks					
0	287	5	Ref.		
1	683	15	1.12	(0.40, 3.12)	0.831
≥ 2	179	5	1.40	(0.40, 4.92)	0.596
Missing	868	14	0.91	(0.29, 2.81)	0.867
Number of casual partners in the last 4 weeks					
0	379	11	Ref.		
1	237	4	0.72	(0.22, 2.32)	0.577
2 – 3	279	5	0.70	(0.24, 2.07)	0.514

≥ 4	245	5	0.73	(0.24, 2.20)	0.574
Missing	877	14	0.61	(0.22, 1.68)	0.337
Number of new partners in the last 4 weeks					
0	449	13	Ref.		
1	237	6	0.81	(0.30, 2.15)	0.665
2 – 3	257	5	0.69	(0.24, 1.97)	0.489
≥ 4	197	1	0.17	(0.02, 1.31)	0.088
Missing	877	14	0.55	(0.21, 1.42)	0.216
Anal sex in the last 3 months					
None	497	4	Ref.		
Insertive only	659	4	0.91	(0.22, 3.66)	0.889
Receptive only	237	17	10.36	(3.42, 31.38)	< 0.001
Both	451	12	3.23	(1.04, 10.04)	0.043
Missing	173	2	2.48	(0.39,15.60)	0.334
Condom frequency with anal sex in last 3 months					
Never	145	5	Ref.		
Sometimes	261	9	0.98	(0.33, 2.94)	0.970
Frequently	81	3	1.11	(0.26, 4.67)	0.891
Always	401	6	0.53	(0.16, 1.76)	0.300
Oral sex – giver **, in last 3 months					
No	285	5	Ref.		
Yes	83	6	4.18	(1.25, 13.94)	0.020
Missing	1,649	28	-		
Oral sex – receiver **, in last 3 months					
No	271	6	Ref.		
Yes	86	5	2.21	(0.64, 7.68)	0.212
Missing	1,649	28	-		
Been paid for sex in the last 3 months					
No	648	10	Ref.		
Yes	624	16	1.92	(0.84, 4.35)	0.120
Missing	745	13	1.62	(0.55, 4.79)	0.382
Paid for sex in last 3 months					
No	819	25	Ref.		
Yes	558	2	0.12	(0.03, 0.49)	0.004
Missing	640	12	0.71	(0.16, 0.91)	0.480
Injection in last 3 months					
No	1,204	20	Ref.		
Yes	63	5	4.88	(1.81, 13.15)	0.002

Missing	750	14	1.56	(0.62, 3.89)	0.344
Tattoo in last 3 months					
No	1,261	25	Ref.		
Yes	6	0	-		
Missing	750	14	1.29	(0.53, 3.12)	0.580
Scarification in last 3 months					
No	1,263	25	Ref.		
Yes	4	0	-		
Missing	750	14	1.29	(0.53, 3.14)	0.573
Blood transfusion in last 3 months					
No	1,266	25	Ref.		
Yes	1	0	-		
Missing	750	14	1.29	(0.53, 3.14)	0.572
Illicit injection in last 4 weeks					
No	1,270	26	Ref.		
Yes	2	0	-		
Missing	745	13	1.07	(0.43, 2.67)	0.887
Alcohol in last 4 weeks					
No	608	9	Ref.		
Yes	1,235	27	1.25	(0.57, 2.74)	0.570
Missing	174	3	1.92	(0.46, 7.99)	0.370
Sex when using alcohol in last 4 weeks					
No	271	7	Ref.		
Yes	970	20	0.87	(0.36, 2.05)	0.742
Missing	776	12	0.81	(0.31, 2.13)	0.668

•Stratified by research center (Kilifi vs. Nairobi)
*For baseline variables, N represents the number of volunteers in a particular category. For time-dependent variables, N represents the number of study visits in which a given response was recorded.
** Data only collected in Nairobi
Ref.: Reference group