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**FEMALE HIV ACQUISITION PER SEX ACT IS ELEVATED IN LATE PREGNANCY AND POSTPARTUM**

**Epidemiology/Public Health:** (R) Epidemiology

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**Background:** In many settings with high HIV prevalence, fertility rates are also high and women spend a significant proportion of their reproductive years pregnant, postpartum, or breastfeeding. Some, but not all, studies have demonstrated significantly higher HIV incidence during pregnancy. Per sex act analyses contribute an understanding of the absolute and relative risks of HIV transmission, and can provide insight into whether increased risk during pregnancy and postpartum is attributable to biological or sexual behavior changes. These data are critical to inform the delivery of HIV prevention interventions for women.

**Methods:** 2,751 African HIV serodiscordant couples with HIV uninfected female partners were followed prospectively for  $\leq 48$  months in two HIV prevention studies. Sexual frequency and condom use was reported monthly. HIV and pregnancy testing occurred monthly or quarterly depending on the study. Study time was categorized by reproductive stage as early pregnancy, late pregnancy, up to 6 months postpartum, or non-pregnant. HIV events that could not be linked between study partners by genetic sequencing were excluded. We used a complementary log-log model to compare the probability of male-to-female HIV transmission per sex act by reproductive stage. The reference case for HIV transmission probability is a condomless sex act between a 25 year old woman not using PrEP and a male partner with HIV RNA of 10,000 copies/ml.

**Results:** Pregnancy incidence was 12.50 per 100 woman-years (95% CI: 11.52-13.55) and 82 HIV transmission events occurred. The HIV transmission probability was 1.05 per 1,000 sex acts when women were not pregnant, 2.19 in early pregnancy, 2.97 in late pregnancy, and 4.18 in postpartum women (Figure). After adjustment for condom use, age, use of PrEP, and HIV viral load, the probability of HIV transmission per sex act was significantly higher in late pregnancy (aRR 2.82,  $p=0.01$ ) and postpartum (aRR 3.97,  $p=0.01$ ) compared to non-pregnant time.

**Conclusion:** The risk of HIV transmission per sex act steadily increased through pregnancy and was highest during postpartum, even after accounting for sexual behavior, PrEP, and HIV viral load, suggesting that biological changes during these periods increase HIV risk. While further research is needed to better understand biological susceptibility, scale-up of HIV prevention and testing in antenatal and postpartum care in high HIV prevalence settings is warranted to prevent sexual transmission and identify acute maternal HIV infections.