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HIV Prevention
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Estimation of counterfactual HIV incidence in young women

HPTN 082

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Overview

- HPTN 082 is a clinical trial aimed at **increasing PrEP adherence among young women** in sub-Saharan Africa. Enrollment is targeting high risk women informed by VOICE risk score. **Almost all participants receive PrEP so there is no control.**
- Modeling Goal: Provide counterfactual incidence in HPTN 082 in the absence of PrEP to be used in effectiveness evaluations.
- Key conclusion: **Participant risk factors alone are not predictive** of incidence and must be combined with site specific data on HIV and ART prevalence.

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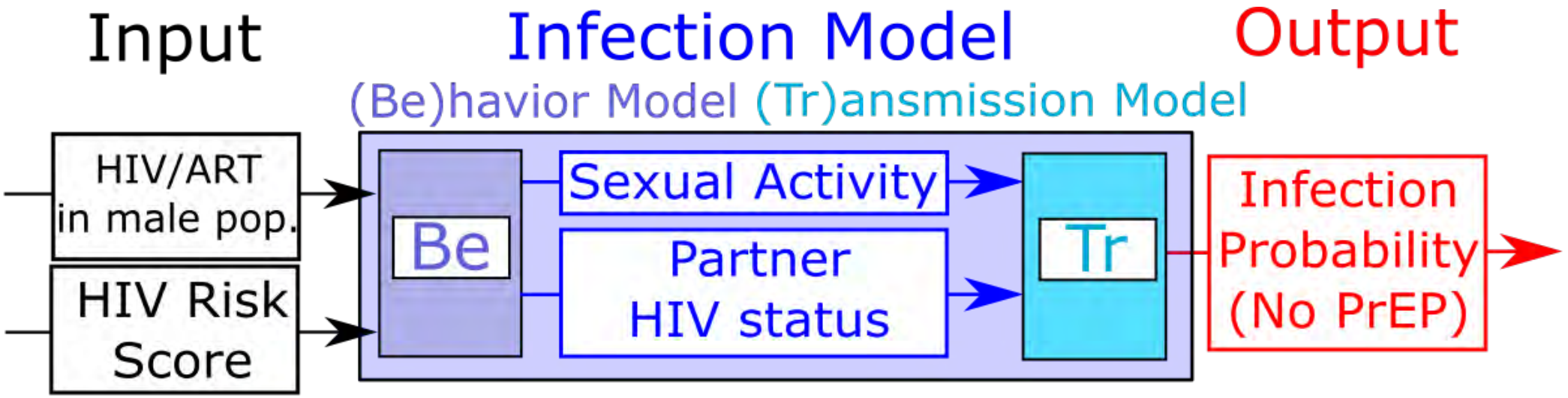
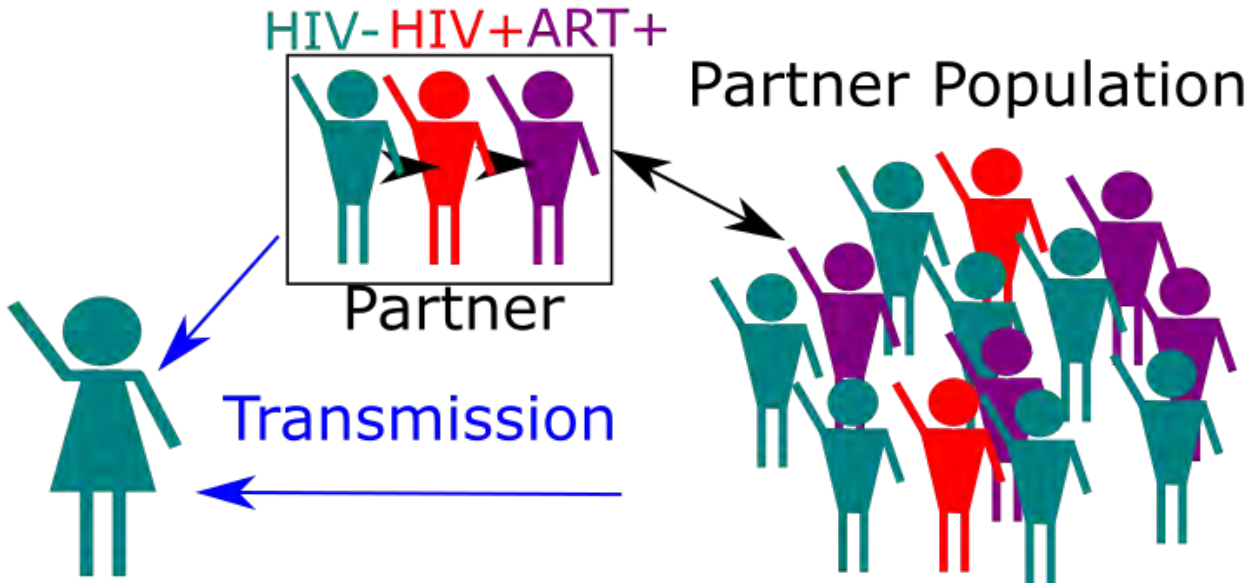




Key Parameters:

-ART/HIV prevalence of male partner
-Must be site/study specific

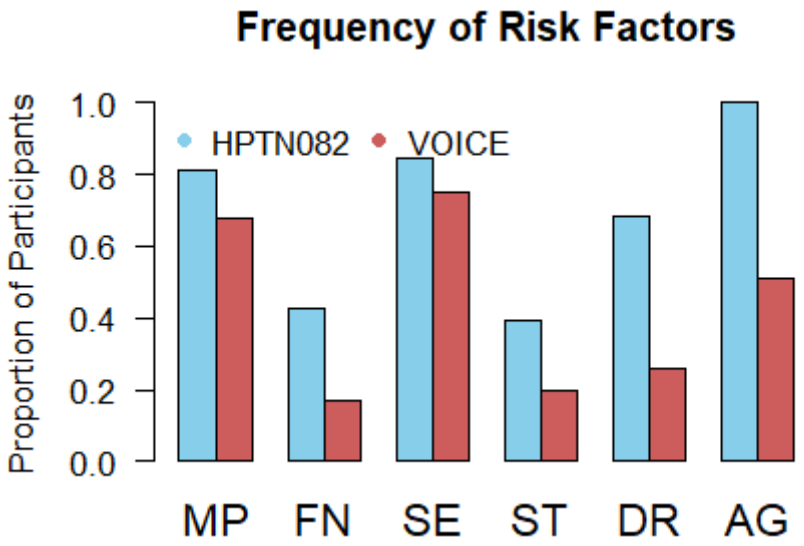
Model Calibrated To:

-HIV incidence by risk score (VOICE)
-Sexual activity by risk score (HPTN082)

VOICE HIV Risk Score

- Composite of six risk factors (see right):
- Scores range from 0-10.
- Derived from seroconversions in **VOICE trial**
- **HPTN 082** participants screened for score ≥ 5
- **Judging by risk scores, we might expect higher untreated HIV incidence in HPTN 082 cohort**

MP: Not living with partner (+2)
FN: No financial support (+1)
SE: Main ptnr. has other ptnrs. (+2)
ST: Treatable STI (+2)
DR: Any Alcohol Consumption (+1)
AG: Age 25 or less (+2)



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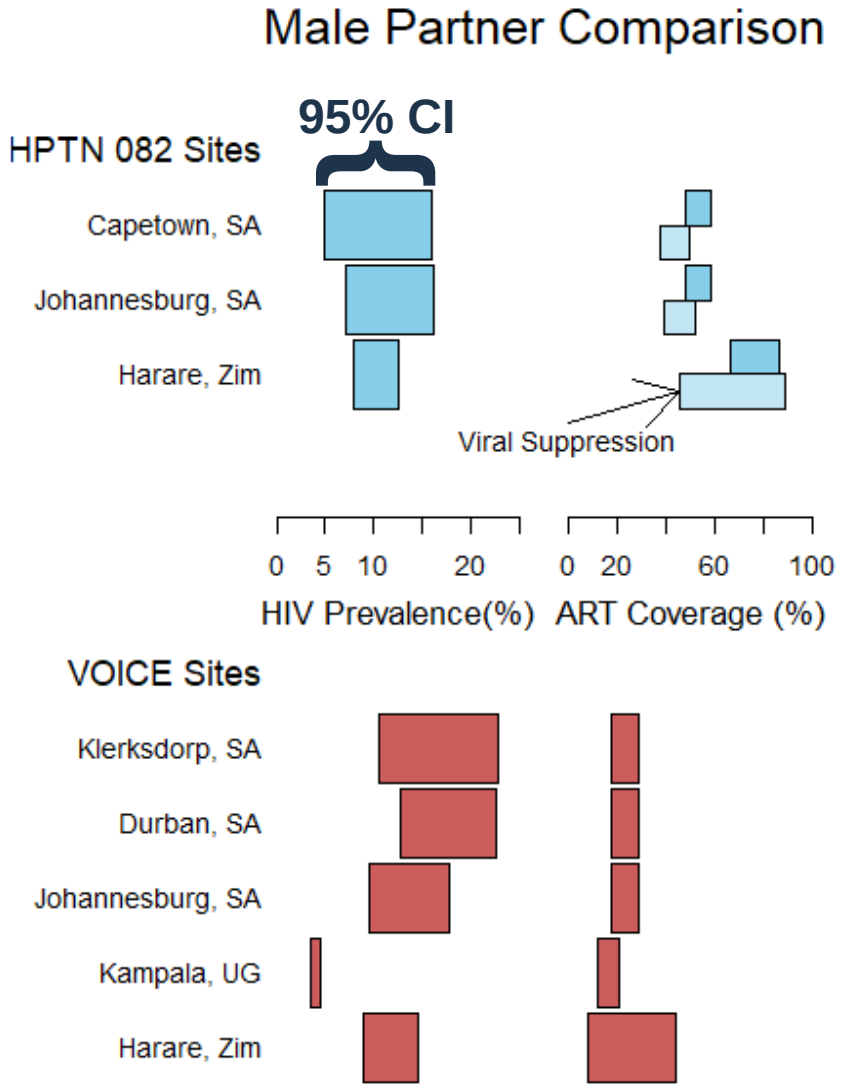
VOICE vs HPTN 082

- Both tested PrEP in women in Southern Africa
- Years of study: **2009-2016 vs 2016-Present**
- In local male population,
  - HIV Prevalence (%): **12-18 vs 8-13**
  - ART Coverage (%): **18-26 vs 57-65**
  - Viral Suppression (%): **???? vs 46-60**
- Participant Age Range: **21-29 vs 16-25**
- Annual HIV incidence: **5.3-6.7 vs ????**
- Sources: UNAIDS, Phia, SA HIV National Behavioral Survey, Uganda HIV Progress Report



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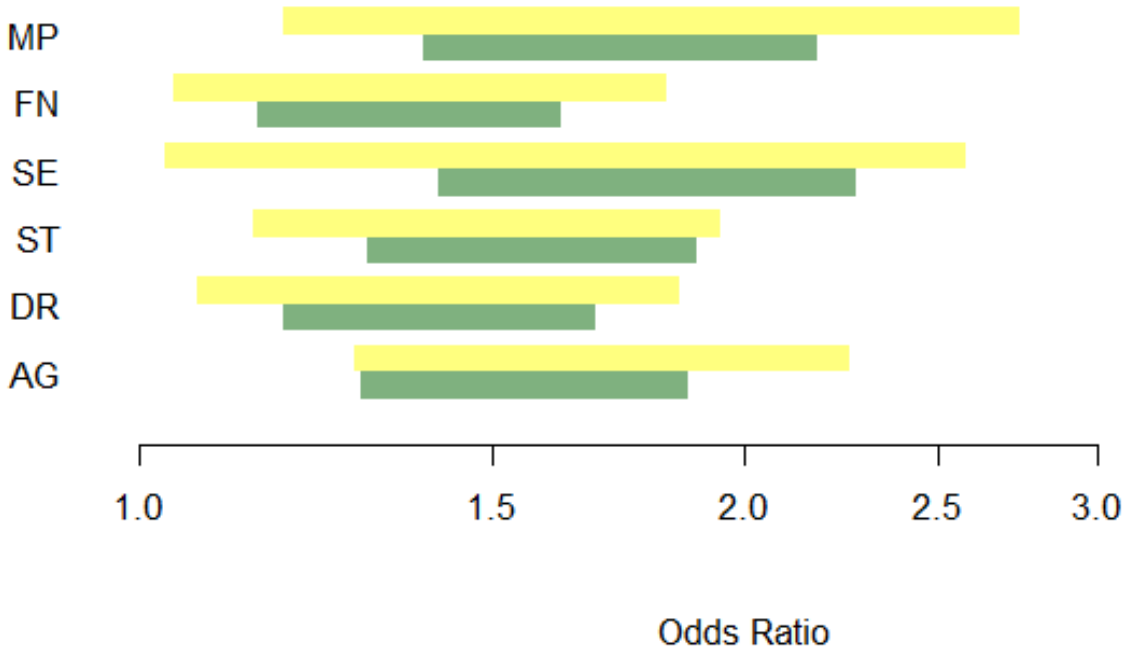
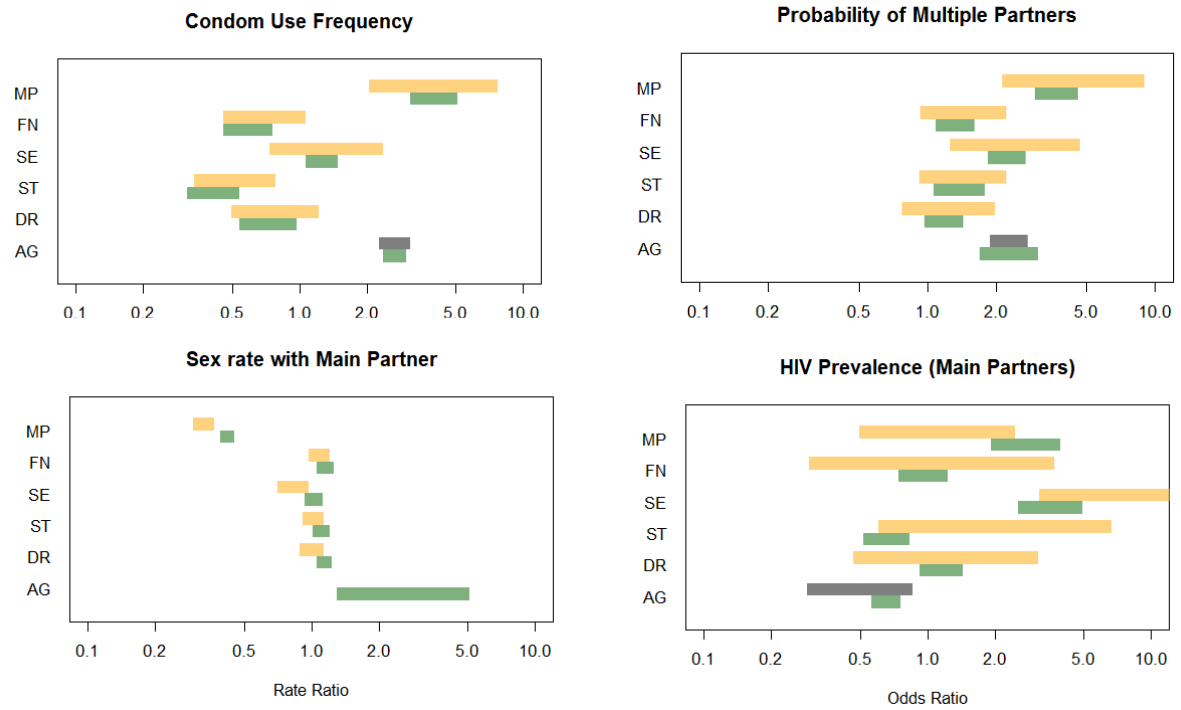
Calibration to HIV infection OR by risk factor in VOICE



Odds Ratio of HIV infection in VOICE (95%CI)

Range Predicted by Model (95%CI)

Association between risk factors and risk behaviors in HPTN 082

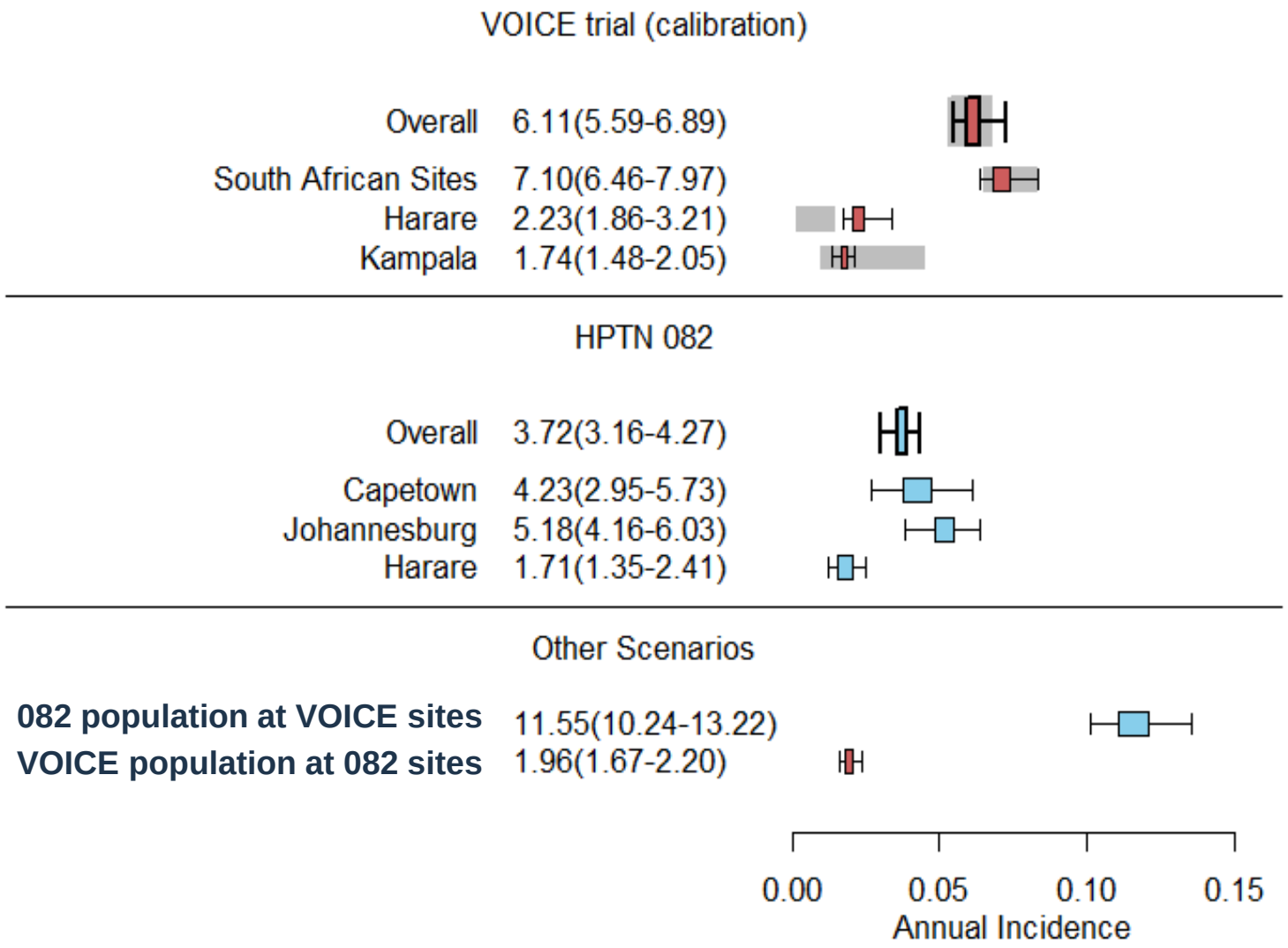


Behavioral Associations from HPTN082 ACASI or literature sources (95%CI)

Range Predicted by Model (95%CI)

Main results

- Calibrated Model provided a good match to VOICE data (Model/Data)
  - We project a 3.7% (3.1-4.3) HIV incidence in HPTN 082 without PrEP
- Both adjusting risk scores or study sites influence results significantly



Summary

- Counterfactual incidence in HPTN 082 in the absence of PrEP: **3.7% (95% CI 3.2-4.3)**
  - Without accounting for changes in HIV/ART prevalence since 2012: 11.6% (10.2-13.2)
  - Without accounting for the high risk screening in HPTN 082: 2.0% (1.7-2.2)
- **Participant risk factors alone are not predictive** of incidence and must be combined with site specific data on HIV and ART prevalence
- Limitations:
  - Assumed that relationship between risk factors and risk behaviors is consistent between populations (of young women in Southern Africa).
  - Other risk-associated factors may change over time
    - Changes in condom usage over time
    - Changes in sexual behavior of HIV+ men due to increased testing

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