



Impact of Combination HIV Interventions on HIV incidence in South-central Uganda: Perspectives from the Rakai cohort

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Combination HIV Intervention in sub-Saharan Africa

- Combination of biomedical, behavioral and structural interventions against HIV
- Modeling studies suggested that high coverage of Antiretroviral therapy (ART) and male circumcision (VMMC) could substantially reduce HIV incidence at population-level
- No empirical evidence of effectiveness of CHI on HIV incidence

Evaluation of the “Real-world” Impact of CHI through the Rakai Cohort

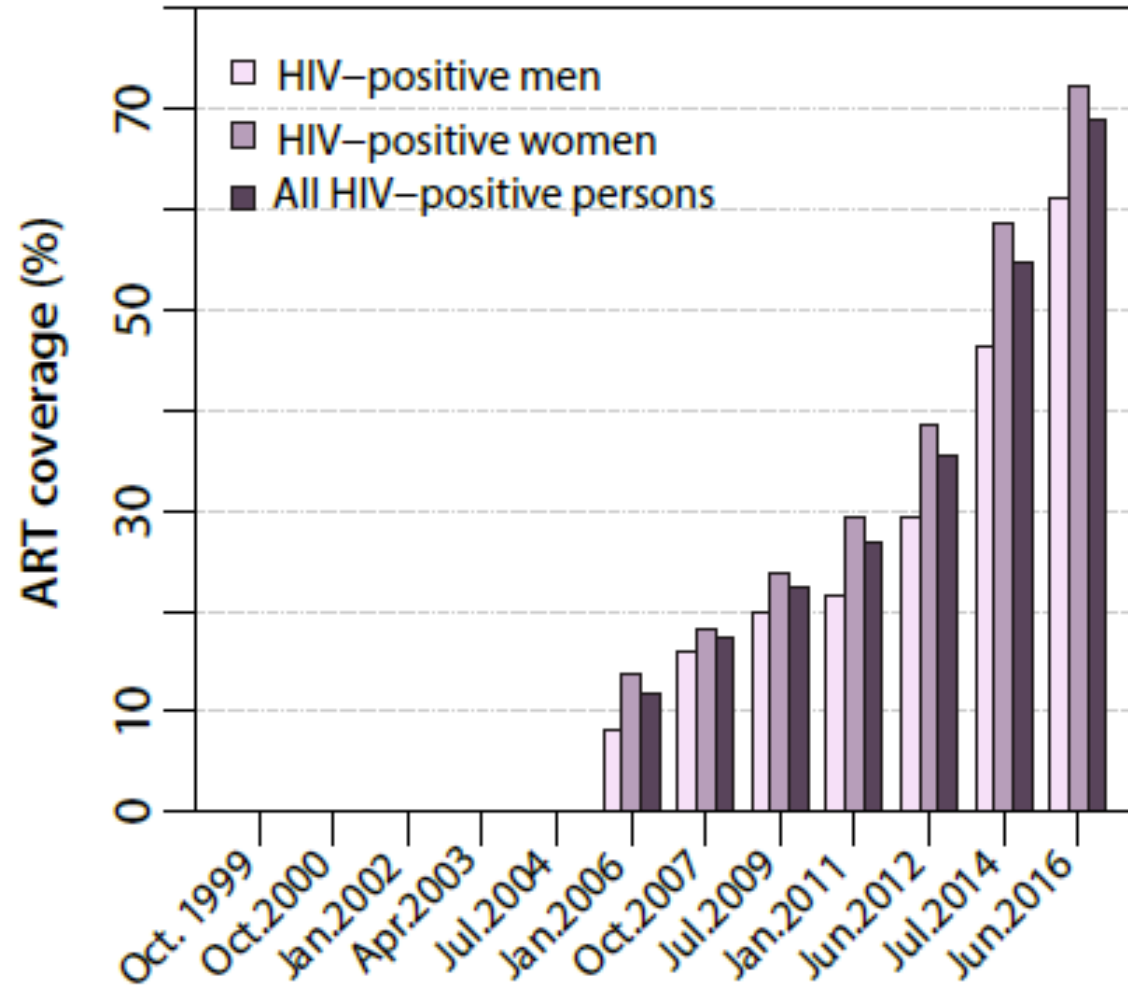
- To assess the “real-world” impact of CHI on HIV incidence, we analyzed long-term population trends in HIV incidence and their associations with:
 1. Trends in ART and VMMC scale-up
 2. Changes in population-level viral load suppression
 3. Trends in sexual behaviors

Methods

- **Rakai Community Cohort Study (RCCS)**
Open, longitudinal population-based cohort of individuals aged 15-49 years.
- **Data:** Demographic, behavioral, service utilization, HIV-testing, viral load
- **CH1 services:** ART, VMMC, HTS, Behavioral change messaging, structural interventions (e.g. School enrolment)
- **Assessed trends in:**
 - self-reported ART and VMMC coverage
 - population-level HIV viral load suppression (<1000 copies/ml)
 - sexual risk behaviors
 - HIV incidence

Results: ART Scale-up

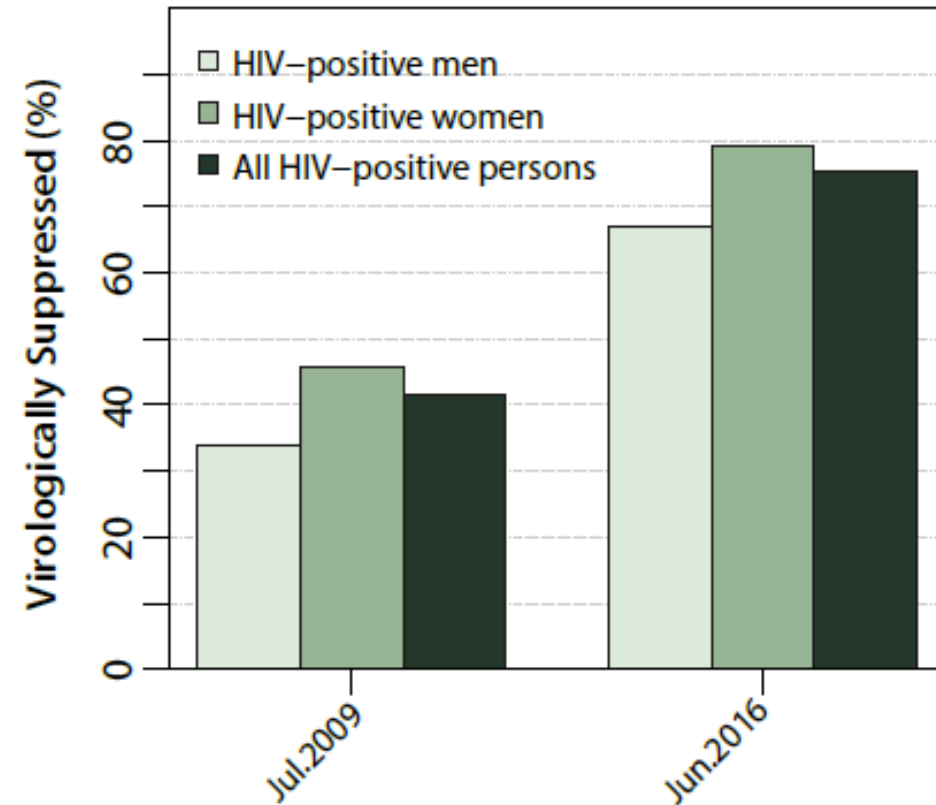
- Self-reported ART increased from 12% to 69% between 2006 and 2016.
- Increases partly a consequence of changing criteria for ART initiation
- By 2016, 61% of HIV-positive men and 72% of HIV-positive women self-reported ART.



Grabowski et al. NEJM. 2017

Viral load Suppression Trends

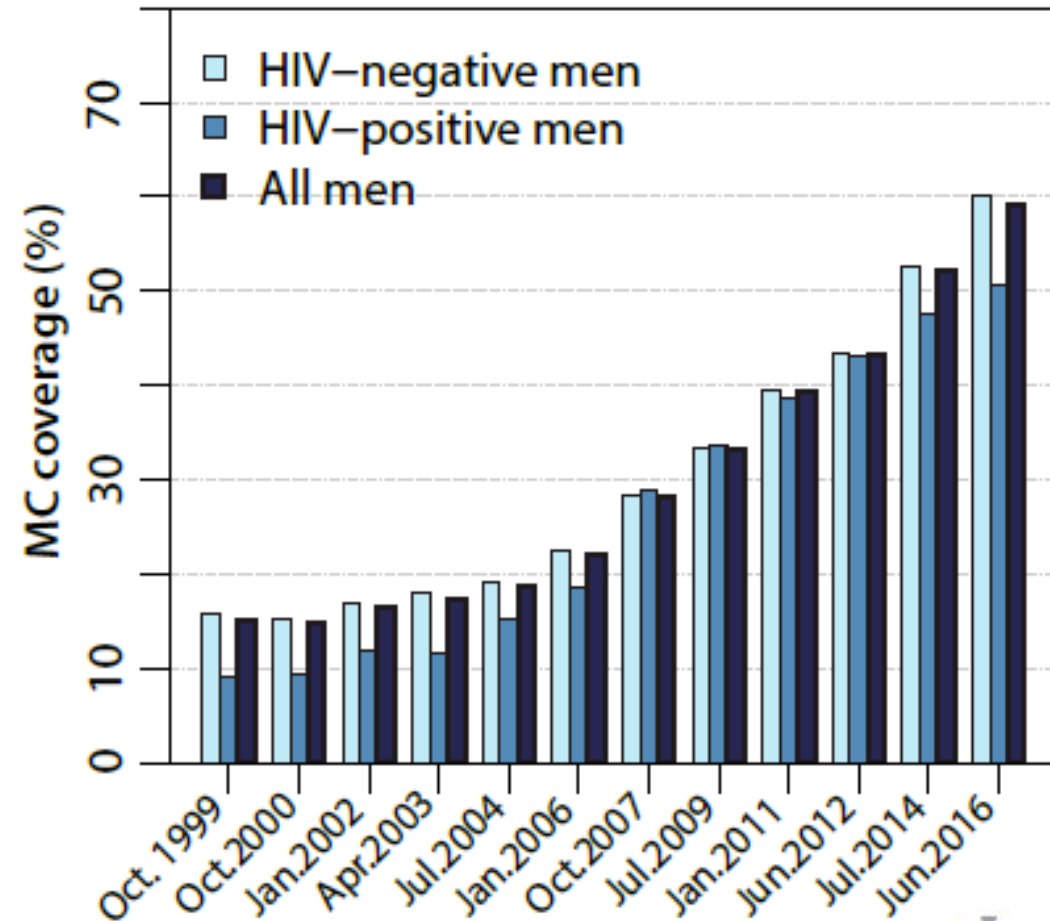
- HIV viral load results obtained for 96% of HIV-positive participants in 2009 and for 99% in 2016.
- By 2016, 75% of **all HIV-positive persons** were virally suppressed compared with 42% in 2009 ($p < 0.001$) (Achieved 90-90-90).
- Suppression among self-reported ART users was 94% and did not differ by gender.



Grabowski et al. NEJM. 2017

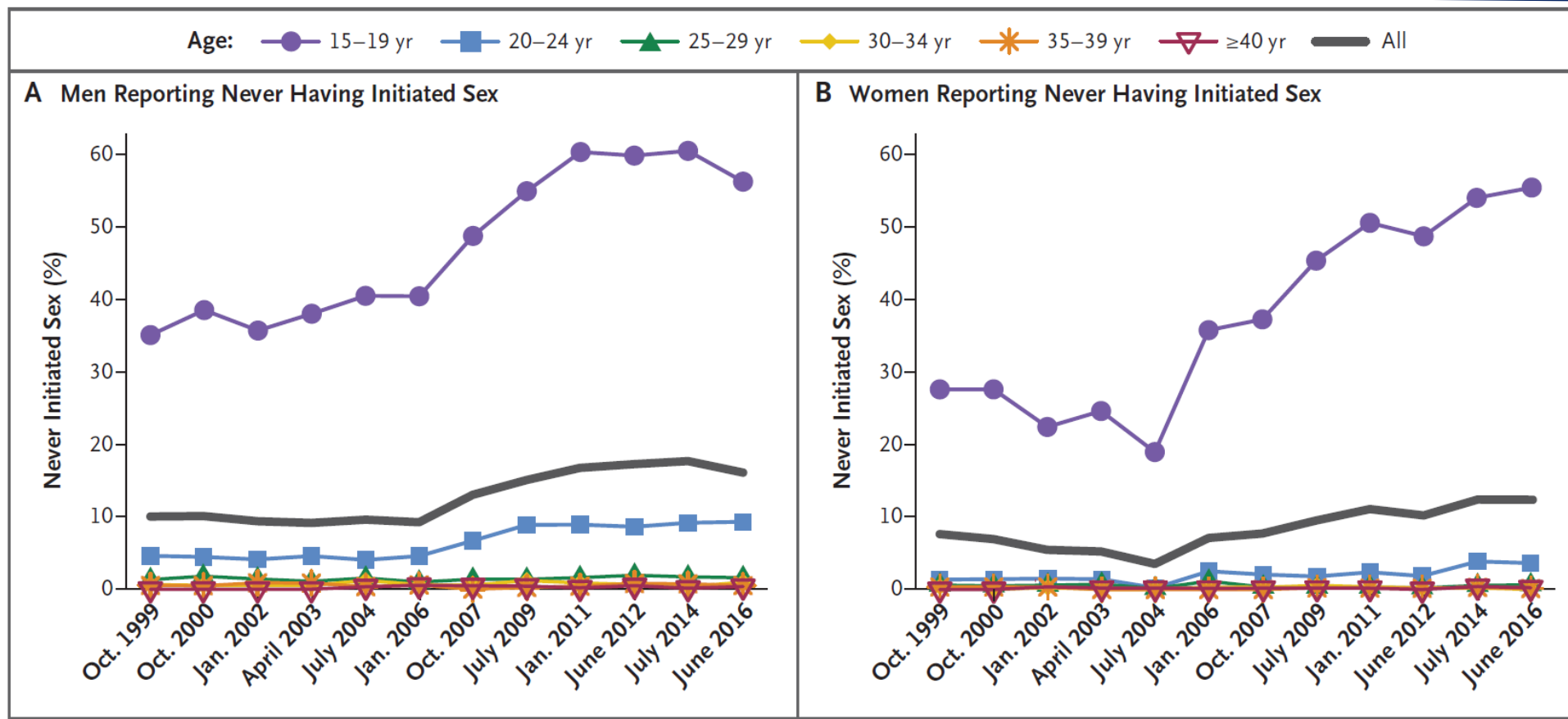
Male Circumcision Coverage

- Male circumcision coverage significantly increased from 15% in 1999 to 59% in 2016 among all men ($p < 0.001$)
- Among non-Muslim men, coverage increased from 3.5% to 53% over the same time period.



Grabowski et al. NEJM. 2017

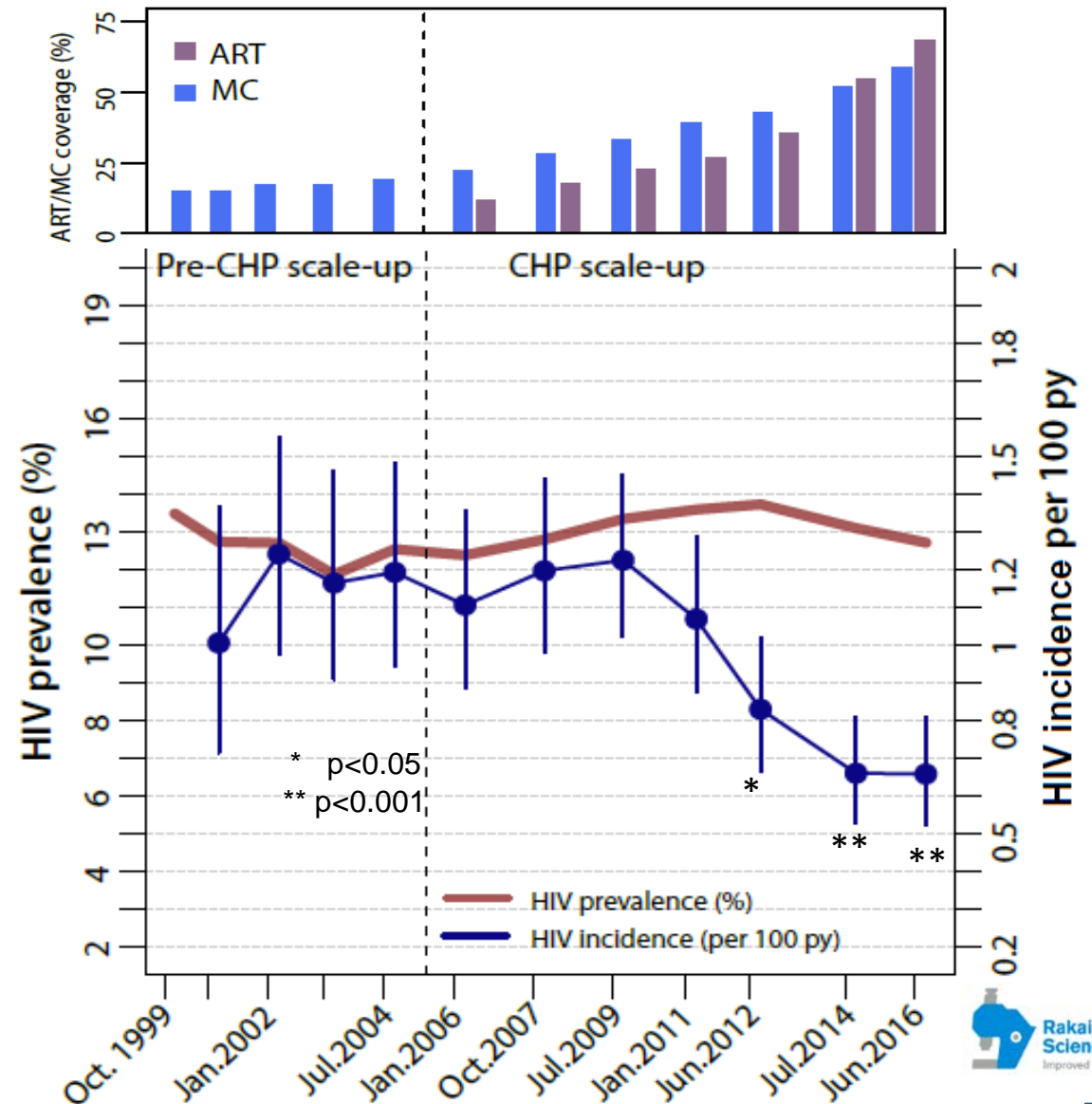
Trends in Sexual debut



- % not initiating sex increased significantly among adolescents.
- No changes in proportions reporting multiple partners or in condom use with casual partners.

HIV Prevalence and Incidence Trends

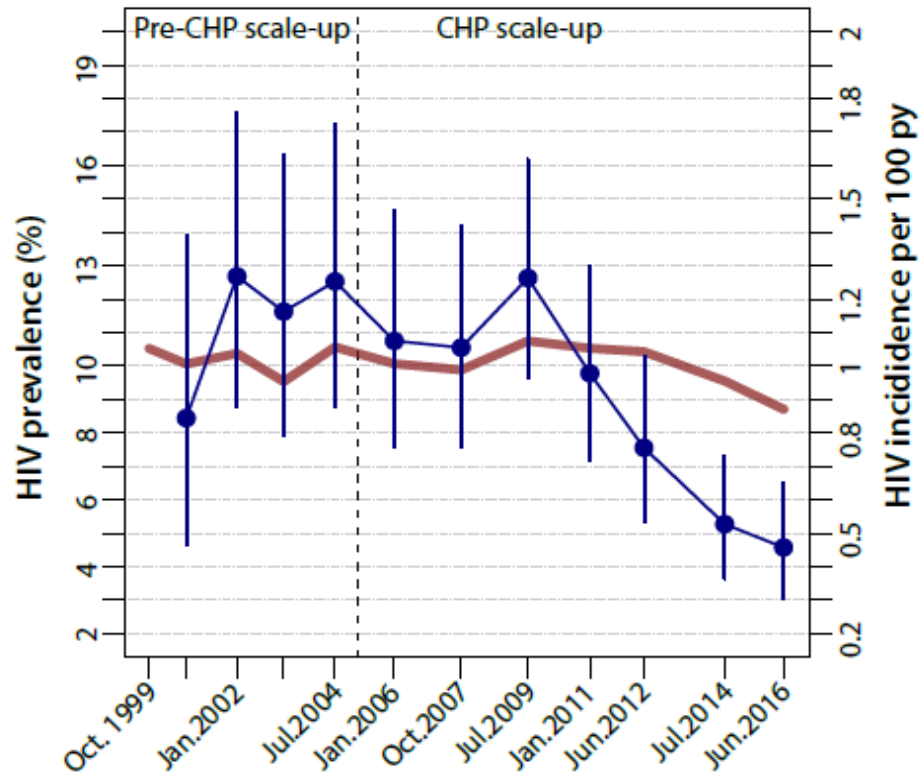
- HIV incidence remained stable prior to and early during CHI scale-up.
- Incidence declined from 1.16/100 py to 0.66/100 py in 2016 ($p < 0.001$).
- Relative to pre-CHI period, **42% decline in incidence by 2016** (aIRR=0.58; 95%CI: 0.45-0.76).



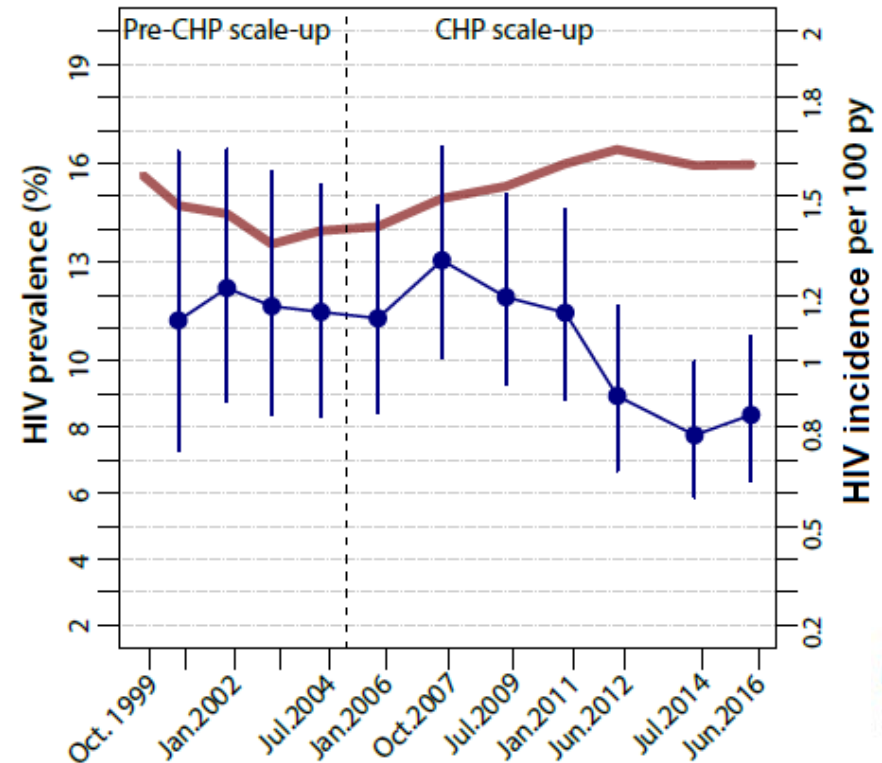
HIV Prevalence and Incidence by Gender

- HIV incidence **declined 54% in men** (adjIRR=0.46; 95%CI: 0.29-0.73) **and 32% in women** (adjIRR=0.68, 95%CI: 0.50-0.94).

Men

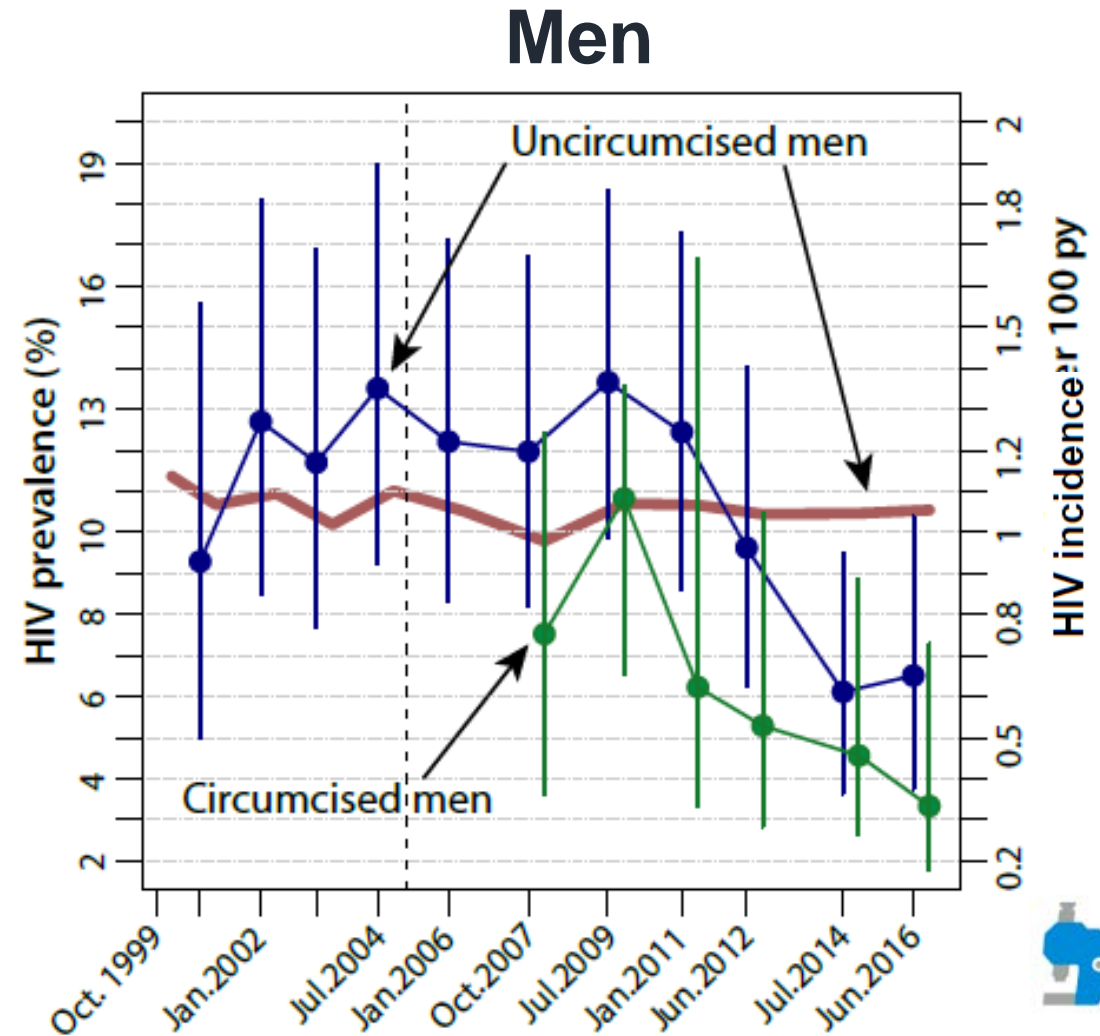


Women



HIV Prevalence and Incidence by Male circumcision status

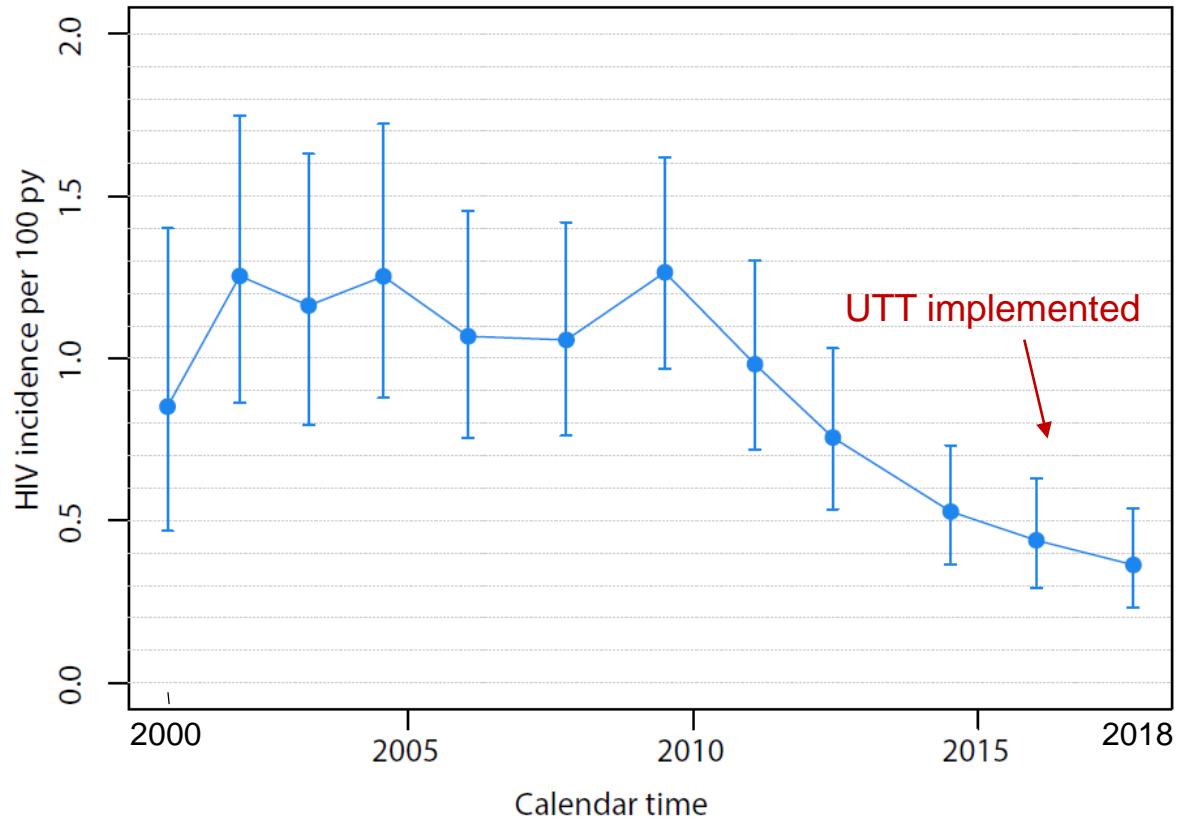
- HIV incidence was 39% lower among circumcised compared to uncircumcised men (adjIRR=0.61; 95%CI: 0.48-0.79).
- However, incidence declined significantly in both circumcised men (aIRR=0.43; 95%CI: 0.19-99) and uncircumcised men (aIRR: 0.51, 95%CI: 0.29-0.88).



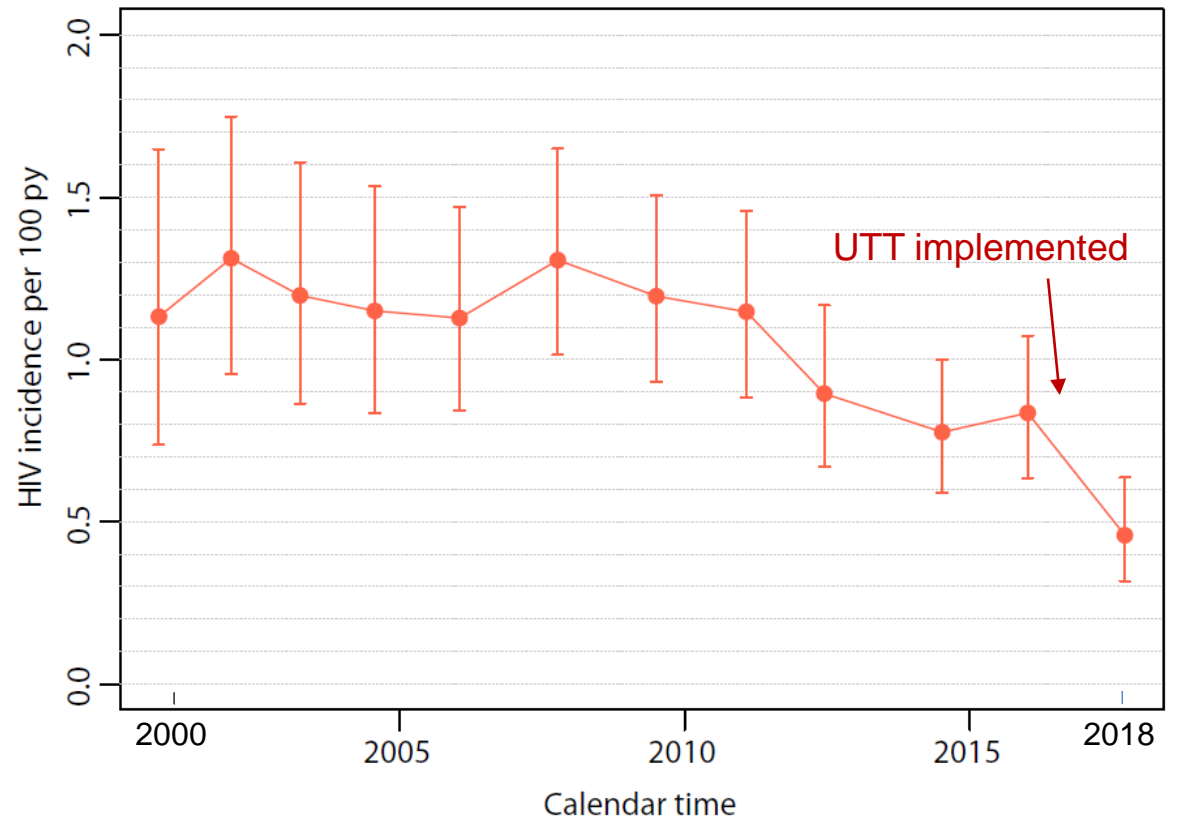
Grabowski et al. NEJM. 2017

HIV Incidence Trends (1999- 2018)

RCCS Male HIV incidence trends, 1999-2018



Female HIV incidence trends, 1999-2018



Unpublished



Did CHI Reduce HIV incidence in Rakai's Hyperendemic Fishing Communities on Lake Victoria?

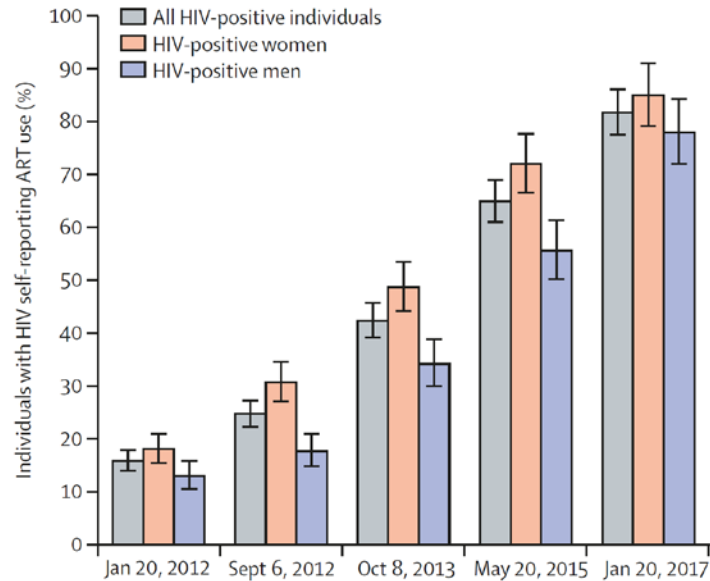
Impact of CHI on HIV incidence in HIV hyperendemic Fishing Community on L. Victoria.

- Study setting:
 - HIV Prevalence ~40%
 - High levels of mobility and risky sexual behaviors including transactional sex
 - Starting late 2011, major ramp up of CHI including UTT and VMMC

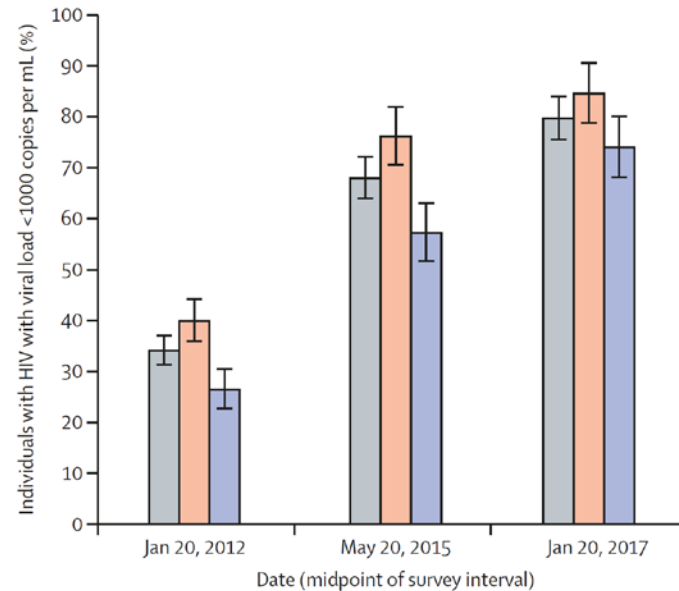


Increasing Coverage with ART and VMMC in Lake Victoria Fishing Communities with UTT and VMMC scale-up

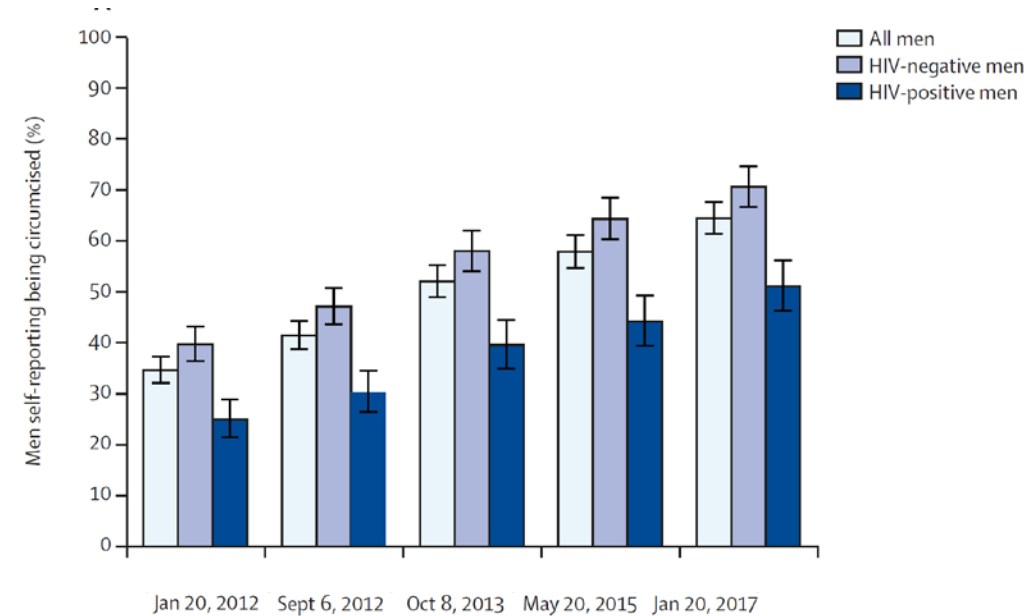
ART coverage



VL suppression



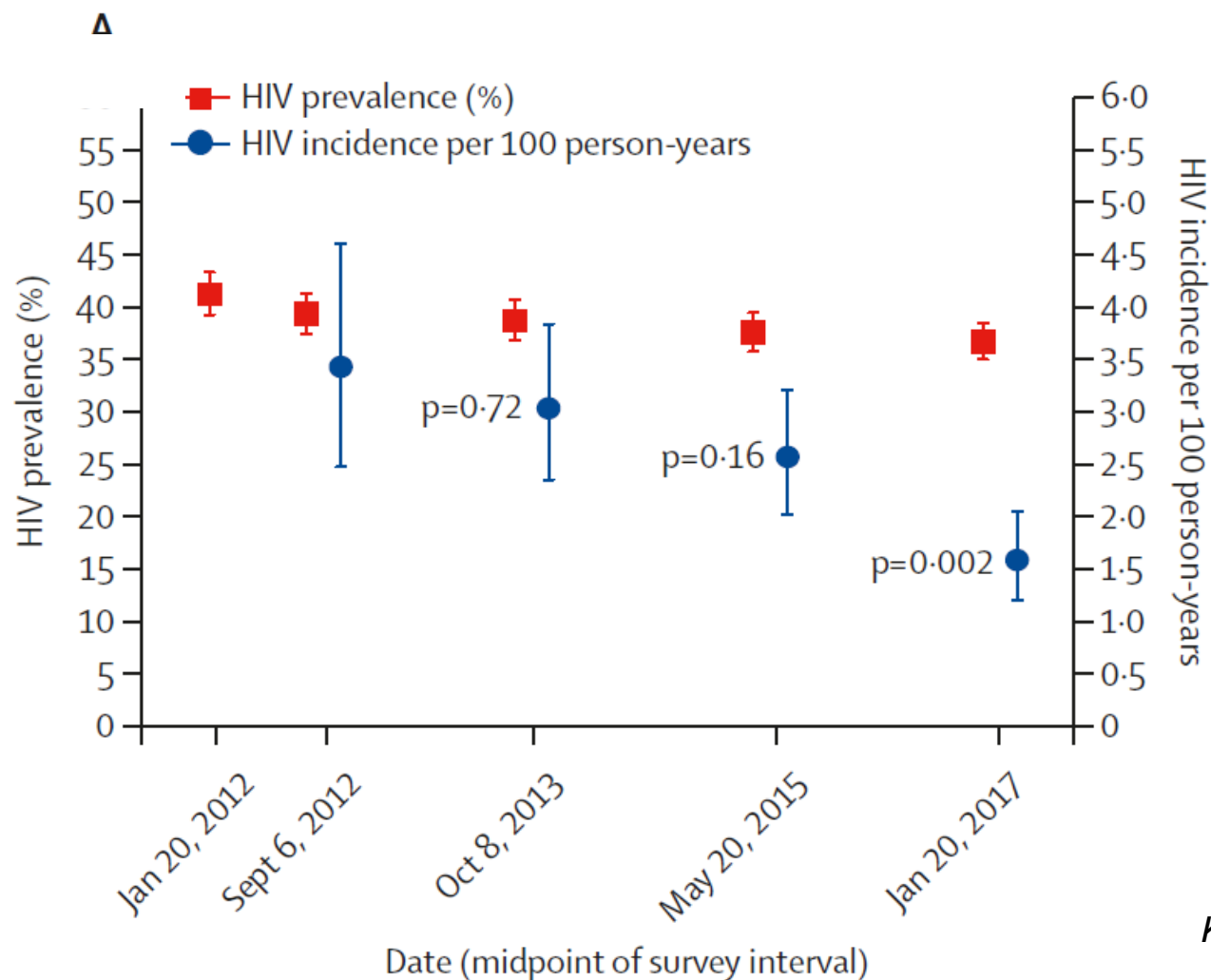
VMMC coverage



Kagaayi, Chang et al., Lancet HIV 2019



HIV Prevalence and Incidence Trends in Fishing Communities



- 48% overall reduction in HIV incidence with UTT and VMMC scale-up over a period of 5 years (IRR=0.52, 95%CI: 0.34-0.79).
- No differences by gender

Kagaayi, Chang et al., Lancet HIV 2019

Summary

- In this prospective population-level study, HIV incidence significantly declined by 42% in the general communities and 48% in fishing villages as ART and VMMC were scaled and sexual activity in adolescents declined
- Results are very encouraging
- However, even at “90-90-90” and circumcision at 60% coverage, incidence remains well above elimination levels (0.1/100 pys).