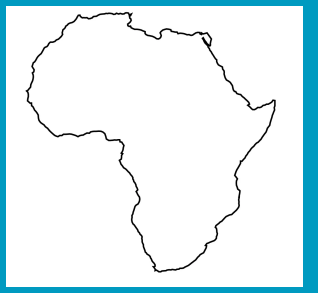

23 December 2011 | $10
Science
BREAKTHROUGH
OF THE YEAR
HIV Treatment as Prevention
AAAS

HPTN
HIV Prevention
Trials Network

Factors associated with HIV infection in serodiscordant couples in an African setting: HPTN 052 study sub-analysis

Wilfred T. Gurupira MPH

HPTN International Scholar (2018-19)



University of Zimbabwe College of Health Sciences – Clinical Trials Research Centre

Innovation in HIV Prevention Research Workshop, 22 August 2019

HPTN 052: Immediate vs Delayed ART for HIV Prevention in Serodiscordant Couples

HIV-infected, sexually active serodiscordant couples; CD4+ cell count of the infected partner: 350-550 cells/mm^3 (N = 1763 couples)

Immediate HAART
Initiate HAART at CD4+ cell count 350-550 cells/mm^3
(n = 886 couples)

Delayed HAART
Initiate HAART at CD4+ cell count ≤ 250 cells/mm^3*
(n = 877 couples)

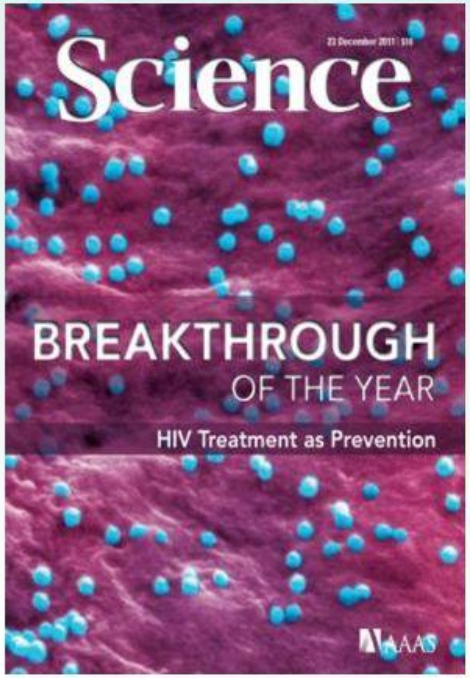
*Based on 2 consecutive values ≤ 250 cells/mm^3.

- Primary efficacy endpoint: virologically linked HIV transmission
- Primary clinical endpoints: WHO stage 4 events, pulmonary TB, severe bacterial infection and/or death
- Couples received intensive counseling on risk reduction and use of condoms

HPTN 052 Enrollment

(Total Enrollment: 1763 couples)

HIV Suppression Stops Transmission



96%

reduction in the risk of transmission to sexual partners

"HPTN 052 is a game changer"

Michel Sidibe Executive Director of UNAIDS

Note: adherence to cART was very high in this well-funded RCT

"How do we pull this off in the real world?" Jim Shelton *Science* 2011

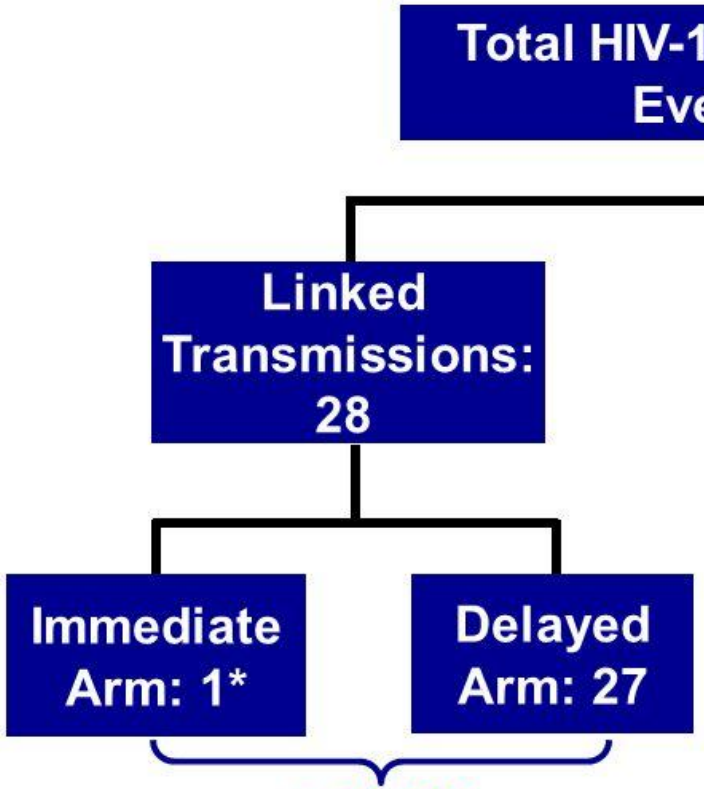
National Institute of Allergy and Infectious Diseases

U.S. Department of Health and Human Services
NATIONAL INSTITUTES OF HEALTH
NIDA NATIONAL INSTITUTE ON DRUG ABUSE

NIMH National Institute of Mental Health

HPTN HIV Prevention Trials Network

HPTN 052 results



- 64% transmissions (tx) from HIV+ w/ CD4 >350 cells/μL & VL >50,000 c/mL
- 82% (23) tx from sub-Saharan Africa
- 64% (18) tx from ♀ to ♂ partners

* Tx likely near time of cART initiation

Cohen MS, et al. *N Engl J Med* 2011.

Research gap: disproportionate number of seroconversions in Africa

Number of couples enrolled

Africa = **954 (54%)**

Asia = 531 (30%)

Americas = 278 (16%)

TOTAL = 1763

Number of seroconversions (linked)

Africa = **23 (82%)**

Asia = 5

Americas = (18%)

TOTAL = 28

(as at interim analysis 2011)

Primary objective

To identify and characterize risk factors associated with HIV infection in serodiscordant couples enrolled into the HPTN 052 study at African sites compared to non-African sites

Secondary objectives:

1. To compare serodiscordant couples across regions
2. To compare patterns of seroconversions by region, study arm and linkage
3. To determine factors associated with HIV infection at African sites compared to non-African sites

Results:

1. Comparison of couples

Similarities	Differences *(at African sites)*
Age group	**Gender**: ↑ *HIV-infected females*
Education level (primary and secondary)	**Education level (no school and post-secondary)**: *less with no school or post-secondary school* ↑
Unprotected sex (no sex or 100% condom use)	**Unprotected sex (<100% condom use)**: *reports of <less than 100% condom use*
Marital status (married, cohabiting)	**# of sexual partners in past week**: *more reports of 3-4 encounters*
Plasma RNA viral load (>400 copies/ml)	**Plasma RNA viral load (<400 copies/ml)**: *more participants with <400 copies/ml*
Randomization arm (immediate vs deferred)	**Type of serodiscordancy**: *more HIV+female, HIV-males couples*

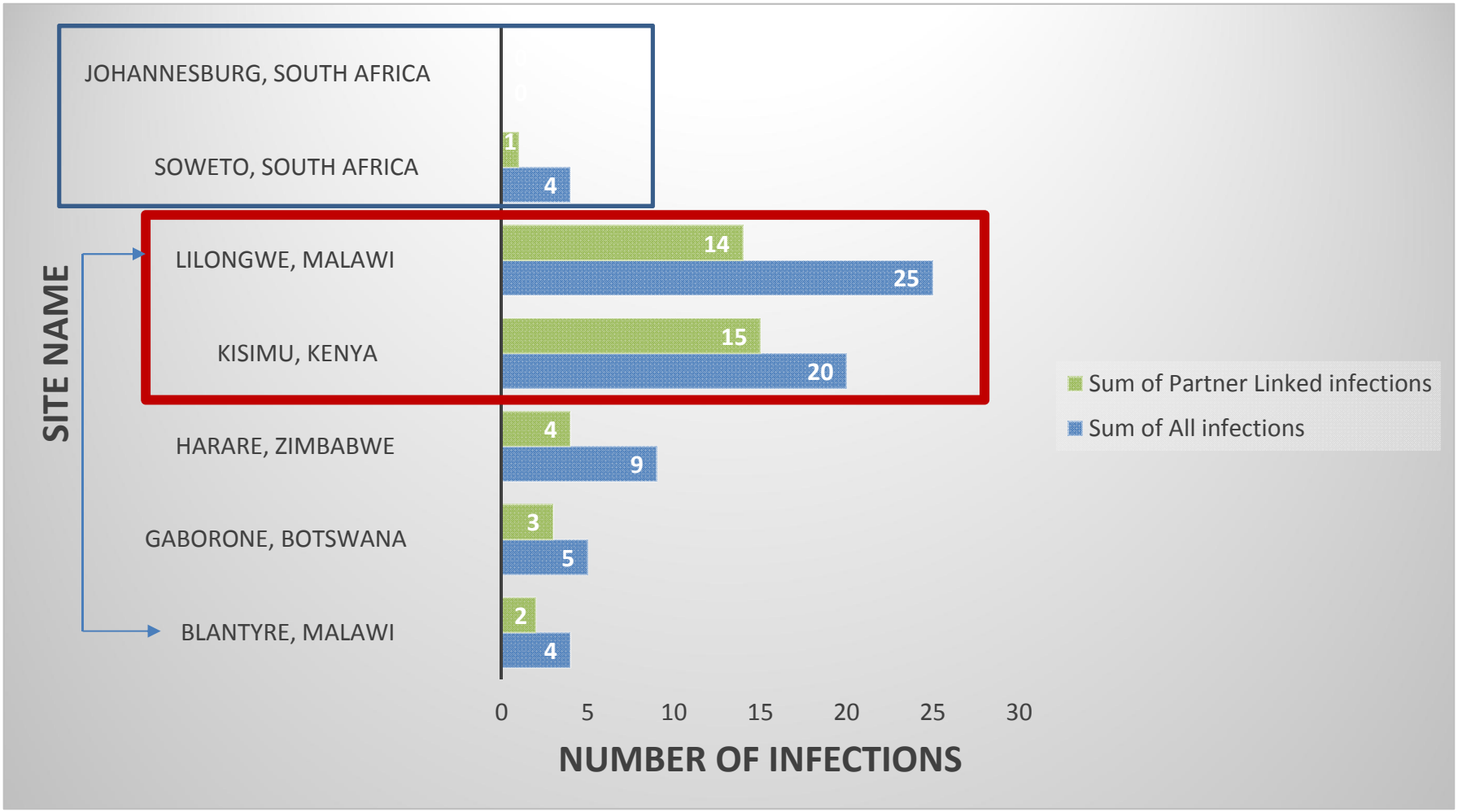
2. Patterns of seroconversions by region, arm and linkage

Incidence of any HIV-1 seroconversion (all sites): disproportionate number of seroconversions in Africa

	Africa			non-Africa		
Randomization Arm	# Partner infections	Incidence Rate (per 100 person years)	95% CI	# Partner infections	Incidence Rate (per 100 person years)	95% CI
	All partner infections					
Immediate ART therapy	16	0.75	[0.43, 1.22]	3	0.14	[0.03, 0.40]
Delayed ART therapy	51	2.50	[1.86, 3.29]	8	0.37	[0.16, 0.74]
Total	67	1.61	[1.24, 2.04]	11	0.25	[0.13, 0.46]
	Linked partner infections					
Immediate ART therapy	2	0.09	[0.01, 0.34]	1	0.05	[0.00, 0.26]
Delayed ART therapy	37	1.81	[1.28, 2.50]	6	0.28	[0.10, 0.61]
Total	39	0.93	[0.66, 1.28]	7	0.16	[0.07, 0.33]

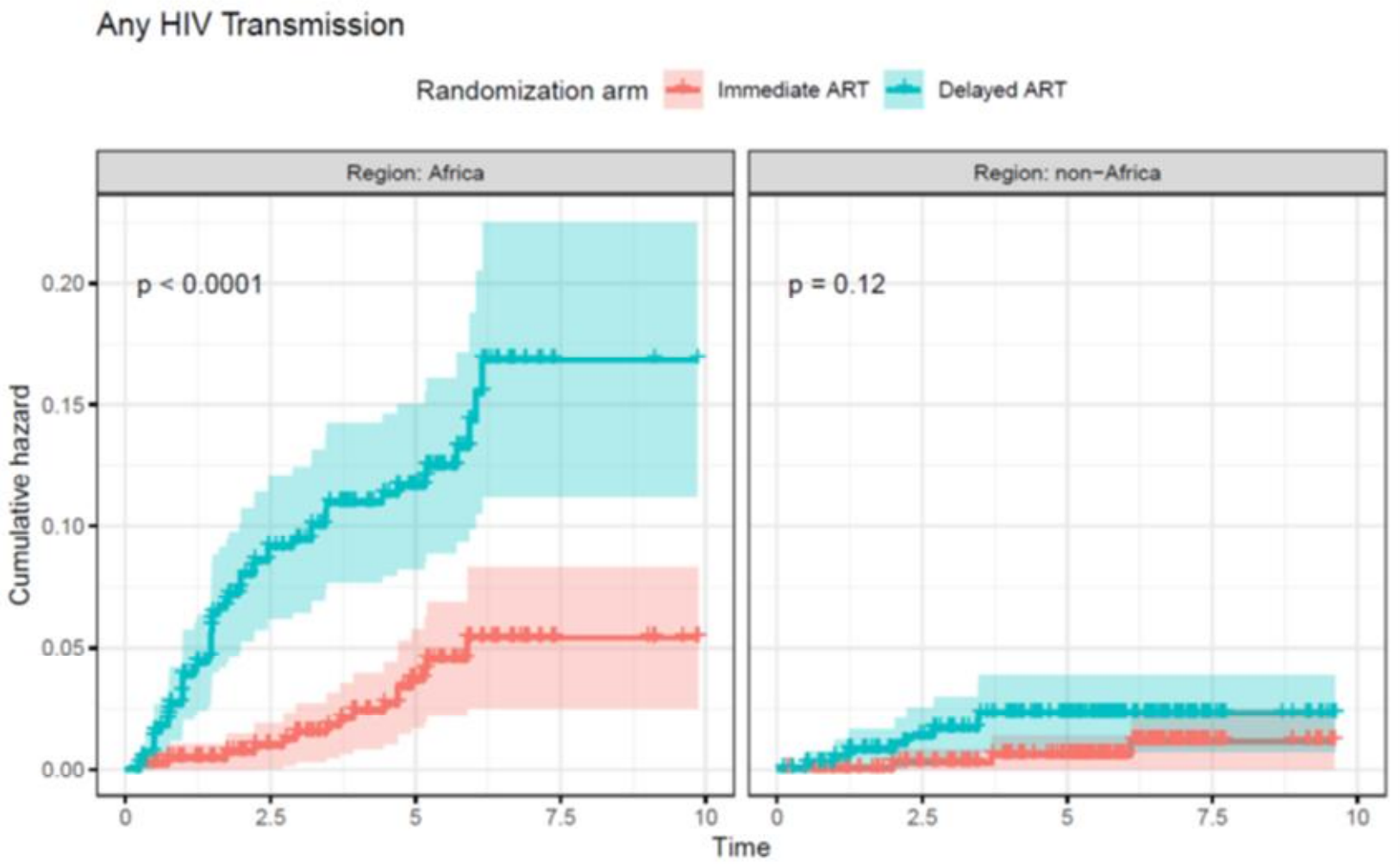
HPTN
HIV Prevention
Trials Network

Number of any and partner-linked HIV-1 seroconversion by site (African sites only)

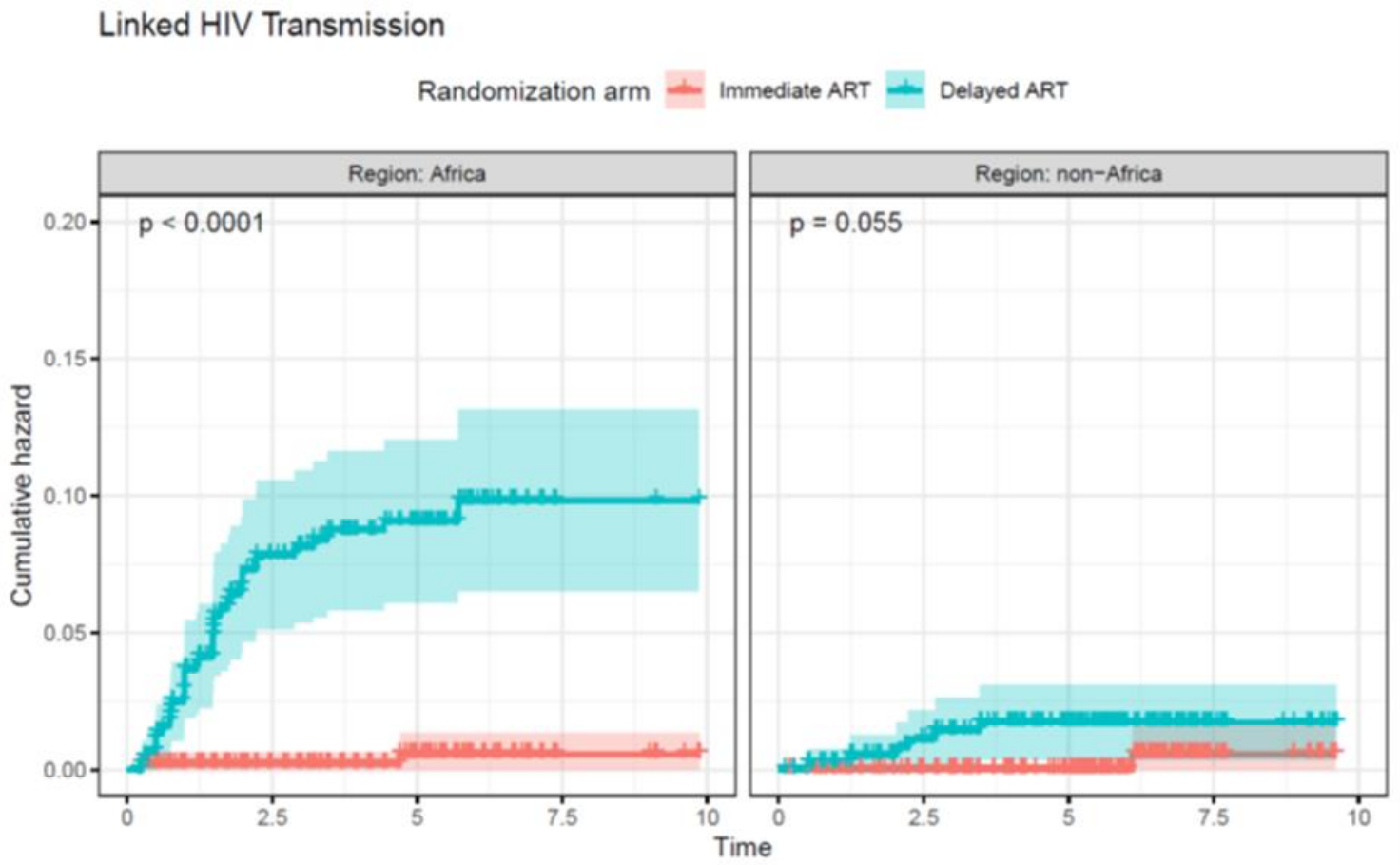


3. Risk of partner infection

Cumulative hazard:



Cumulative hazard:



4. Factors associated with seroconversion

HPTN
HIV Prevention
Trials Network

Baseline variables associated with HIV infection

	Africa	Non-Africa
Variables	**P***	**P***
Gender	0.753	0.553
Age group	0.067	0.636
Education status	0.017	0.180
Marital status	0.422	N/A**
Randomization arm	<.0001	0.117
Unprotected sex	0.730	0.061
# of sex partners in last 3 months	0.519	0.047
Baseline CD4 count***	0.039	0.039
Baseline viral load***	0.604	0.604

*chi-square p-value or fisher exact p-value

**association test not valid

*** two-sample t-test (pooled)

Discussion

Factors associated with HIV infection: Baseline CD4 count, randomization arm (delayed) and education status (primary & secondary school)

- Regional and in country incidence variations (Kisumu and Lilongwe; South Africa and Malawi sites)

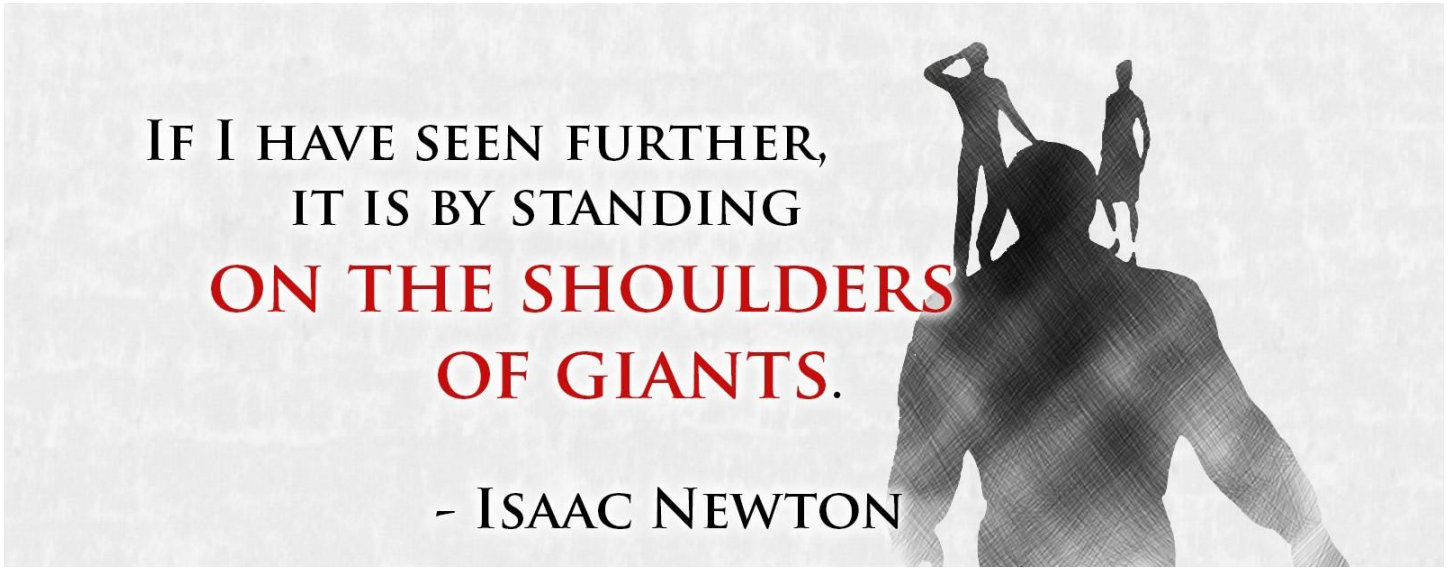
Unexplored factors:

desire for children, number of children, duration of relationship, relationship dynamics

To-be-explored: time varying behavioural variables e.g. outside sexual partners

Conclusion

Need to explore factors associated with HIV infection among African serodiscordant couples


IF I HAVE SEEN FURTHER,
IT IS BY STANDING
ON THE SHOULDERS
OF GIANTS.
- ISAAC NEWTON

HPTN
HIV Prevention
Trials Network

ACKNOWLEDGEMENTS

This work is supported by the HPTN Scholars Programme which is part of the HIV Prevention Trials Network (HPTN)

Mentors: Profs Taha E. Taha and James Hakim

SCHARP statisticians: Jing Wang and Amber Guo

UZ CHS – CTRC: Z.M. Chirenje, J. Brown, A. Markowitz

HPTN International Scholars Programme team: Erica Hamilton and Gabriela Salinas-Jimenez

HPTN 052 Study team

All HPTN Scholars

The HPTN is funded by the National Institute of Allergy and Infectious Diseases (UM1AI068619, UM1AI068613, UM1AI1068617), with co-funding from the National Institute of Mental Health, and the National Institute on Drug Abuse, all components of the U.S. National Institutes of Health.

HPTN
HIV Prevention
Trials Network

HPTN Scholars and Mentors (June 2019)

www.hptn.org/research/scholars

https://twitter.com/HIVptn

https://www.facebook.com/HIVptn