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A Cluster-Randomized Controlled Trial of Antenatal Care and HIV Treatment Integration in Rural Kenya

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Co-Investigators: Janet M. Turan, Sierra Washington, Starley Shade, Marta Ackers, Dorothy Mbori-Ngacha and Elizabeth A. Bukusi

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School of Medicine

Study Background and Rationale

- In 2005, most antenatal care (ANC) services & HIV treatment services were offered in separate clinics
- We recognized missed opportunities and inefficiencies in referral-based systems

- **Hypothesis:** Integrating ANC and HIV treatment services for pregnant women in a single clinic may result in improved maternal outcomes and decreased mother-to-child transmission (MTCT).

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SHAIP Study Design

Study Design	An operational study Prospective cluster randomized controlled trial
Intervention	Full integration of HIV care including highly active antiretroviral therapy (HAART) into antenatal care clinics (intervention), compared to referral for HIV care and treatment (control)
Major outcomes	• Vertical transmission of HIV • Uptake of infant HIV testing • Linkage and retention in care for mother-infant pairs • Maternal health outcomes (WHO stages, CD4 counts)
Study sites	12 facilities in 3 districts
Health facilities	District hospitals, sub-district hospitals, health centers, and dispensaries
Participants	1172 HIV-positive pregnant women (not yet enrolled in HIV care) and their exposed infants
Data sources	Electronic medical records and registers
Study Period	Women enrolled in pregnancy and mother-infant pairs followed for one year.

Separate Clinics at the Facility

ANC / MNCH Clinic

Patient Support Center = HIV Clinic

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The Control Clinics N=6

ANC / MNCH Clinic

Patient Support Center = HIV Clinic

FANC=Focused Antenatal Care

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The Intervention Clinics N=6

ANC / MNCH Clinic

Patient Support Center = HIV Clinic

*Women transferred to PSC 18 months postpartum

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Patient Characteristics at Enrollment

(N=1172 pregnant women)

	Intervention (n=569)	Control (n=603)	P value
Mean age in years (SE)	25.0 (0.19)	24.8 (0.18)	0.58
Education, n (%)			
None or Some Primary	481 (85%)	533 (89%)	0.37
Some Secondary or more	84 (15%)	68 (11%)	
Marital status, n (%)			
Married	472 (84%)	500 (84%)	0.99
Single/Separated/Divorced	49 (8%)	50 (8%)	
Widowed	43 (8%)	48 (8%)	

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Patient Characteristics at Enrollment

(N=1172 pregnant women)

	Intervention (n=569)	Control (n=603)	P value
Median Gravidae (IQR)	3 (2-4)	3 (2-4)	0.94
Median Parity (IQR)	2 (1-3)	2 (1-3)	0.92
Mean Gestational Age in weeks (SE)	26 (0.3)	25.2 (0.3)	0.10
WHO HIV stage n (%)			
WHO Stage 1	339 (63%)	455 (80%)	0.40
WHO Stage 2	79 (15%)	42 (7%)	
WHO Stage 3 or 4	31 (6%)	8 (1%)	
Not Staged	85 (15%)	67 (12%)	
Mean Baseline CD4 (SE)	495 (19.87)	523 (19.18)	0.34
Eligible for HAART	127 (22%)	87 (14%)	0.28

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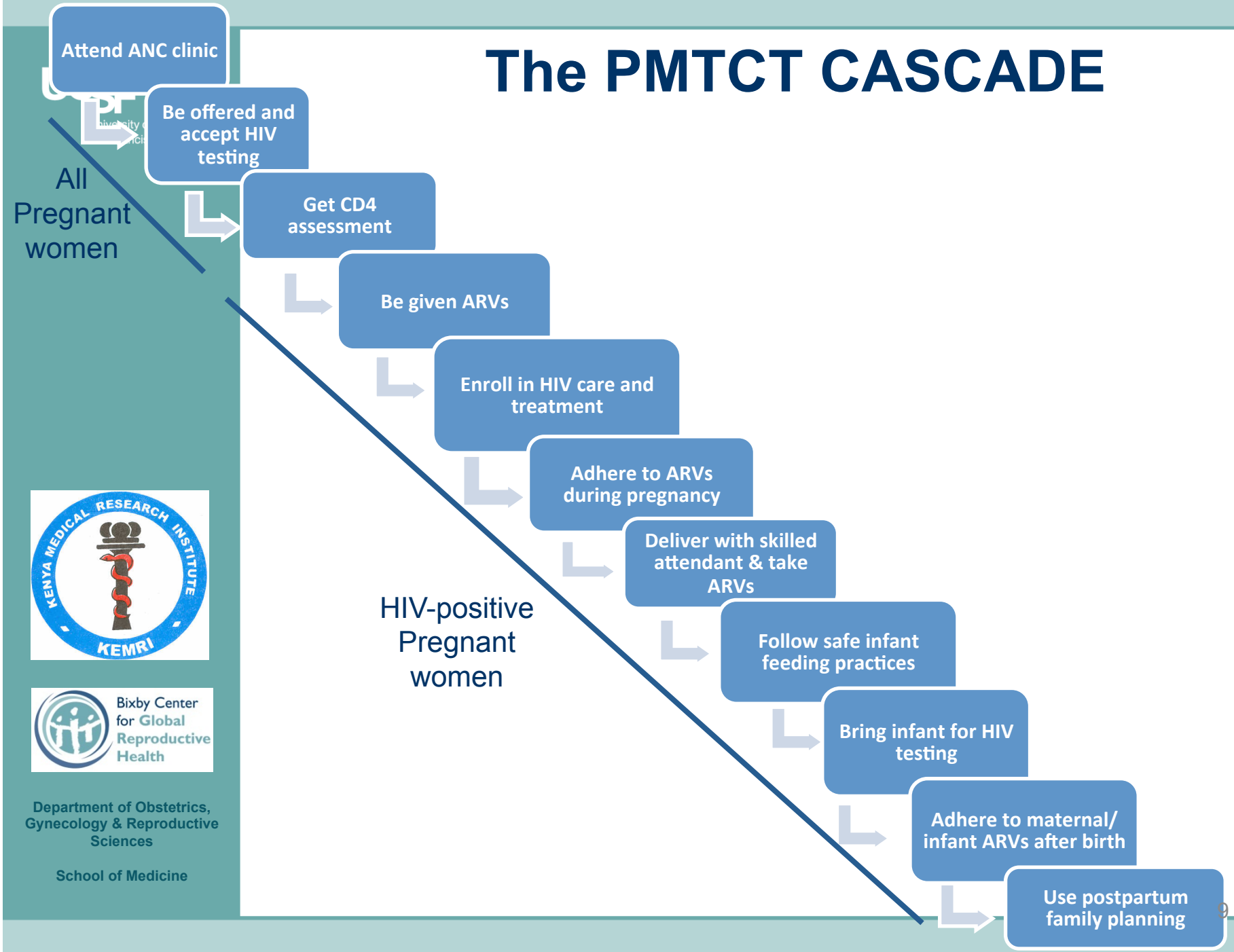
The PMTCT CASCADE



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Get baseline CD4

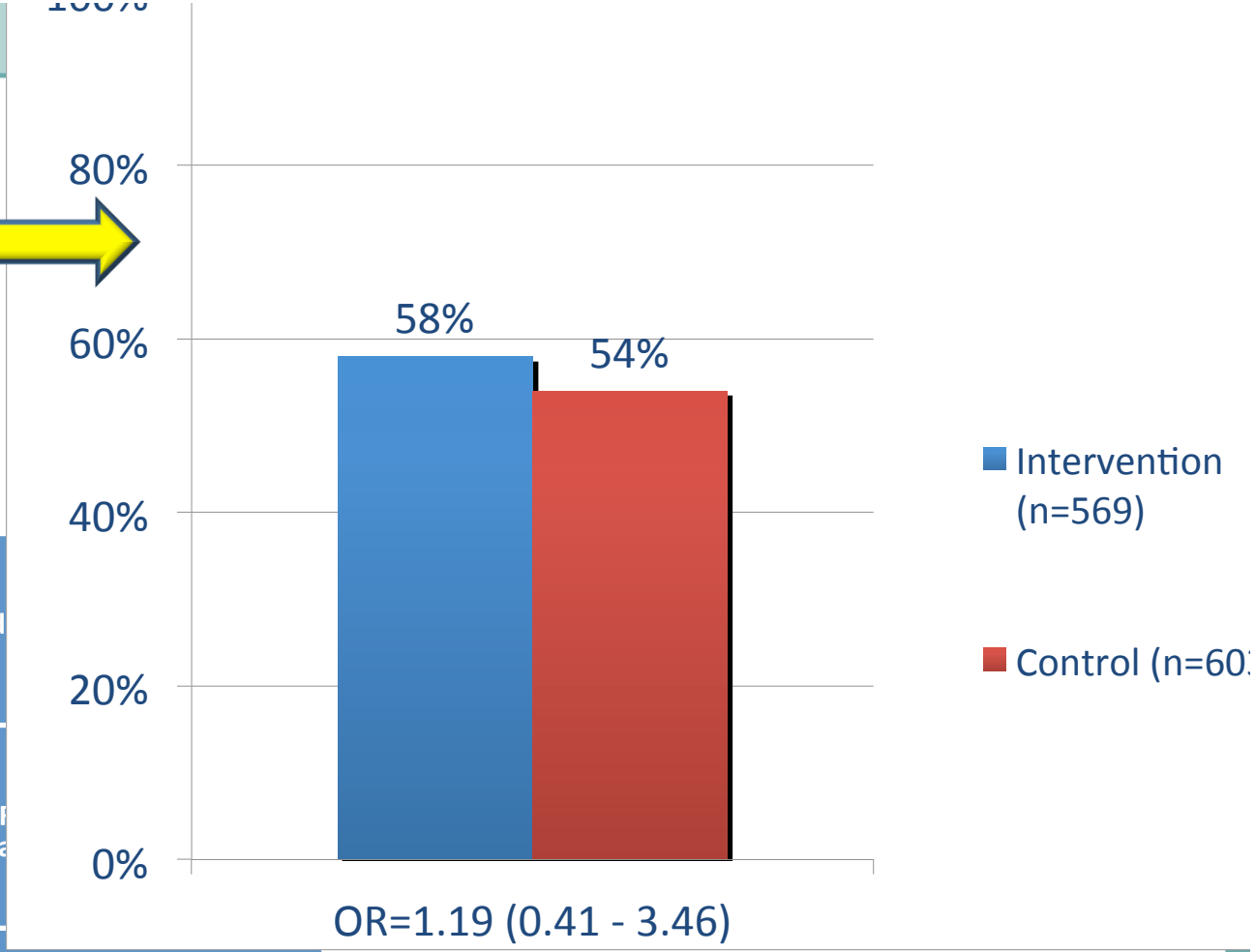
Be given ARVs

Enroll in HIV care and treatment

Adhere to AR pregna

Deliver with skilled attendant and take ARVs

Bring infant for HIV testing



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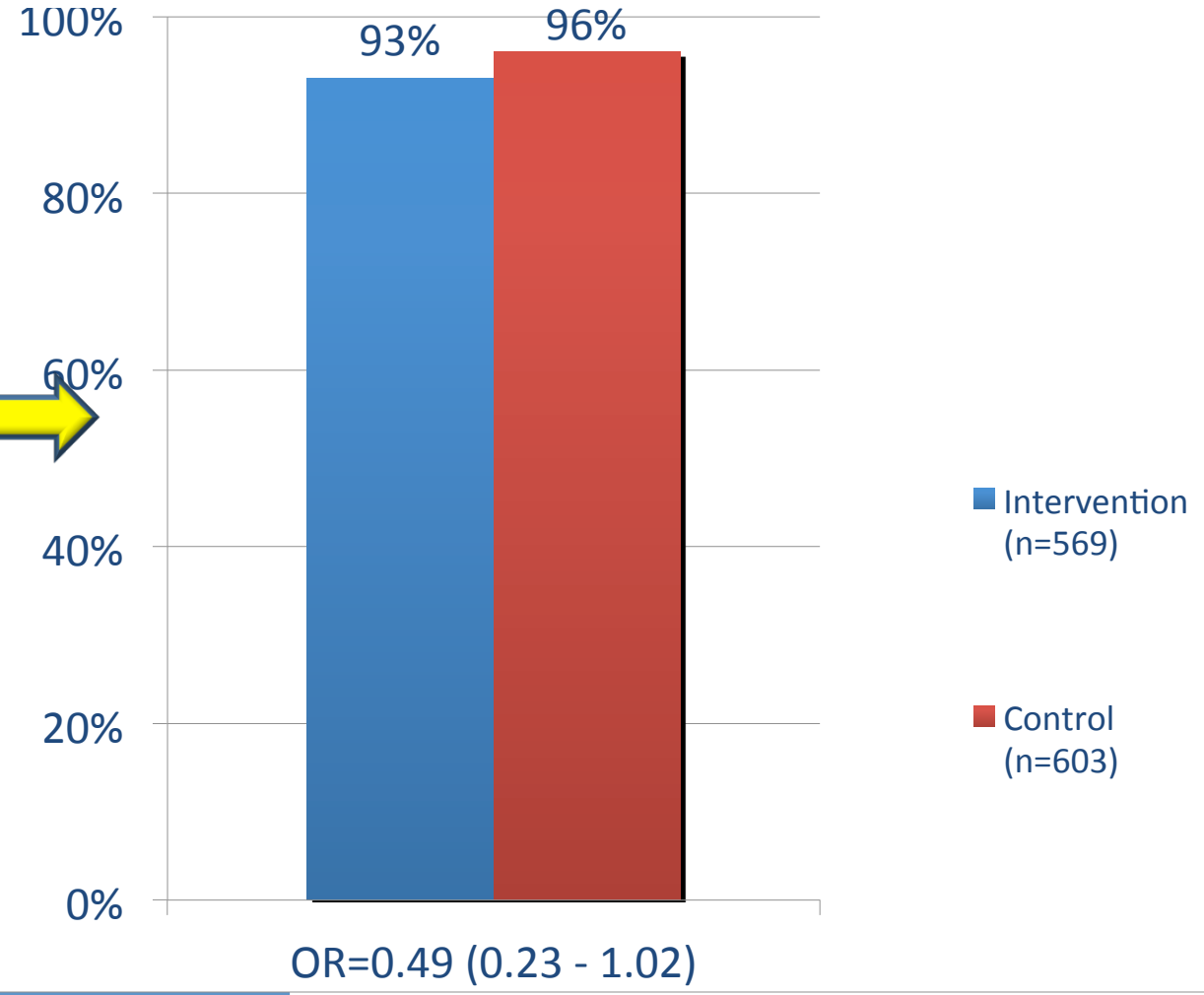

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Get baseline CD4

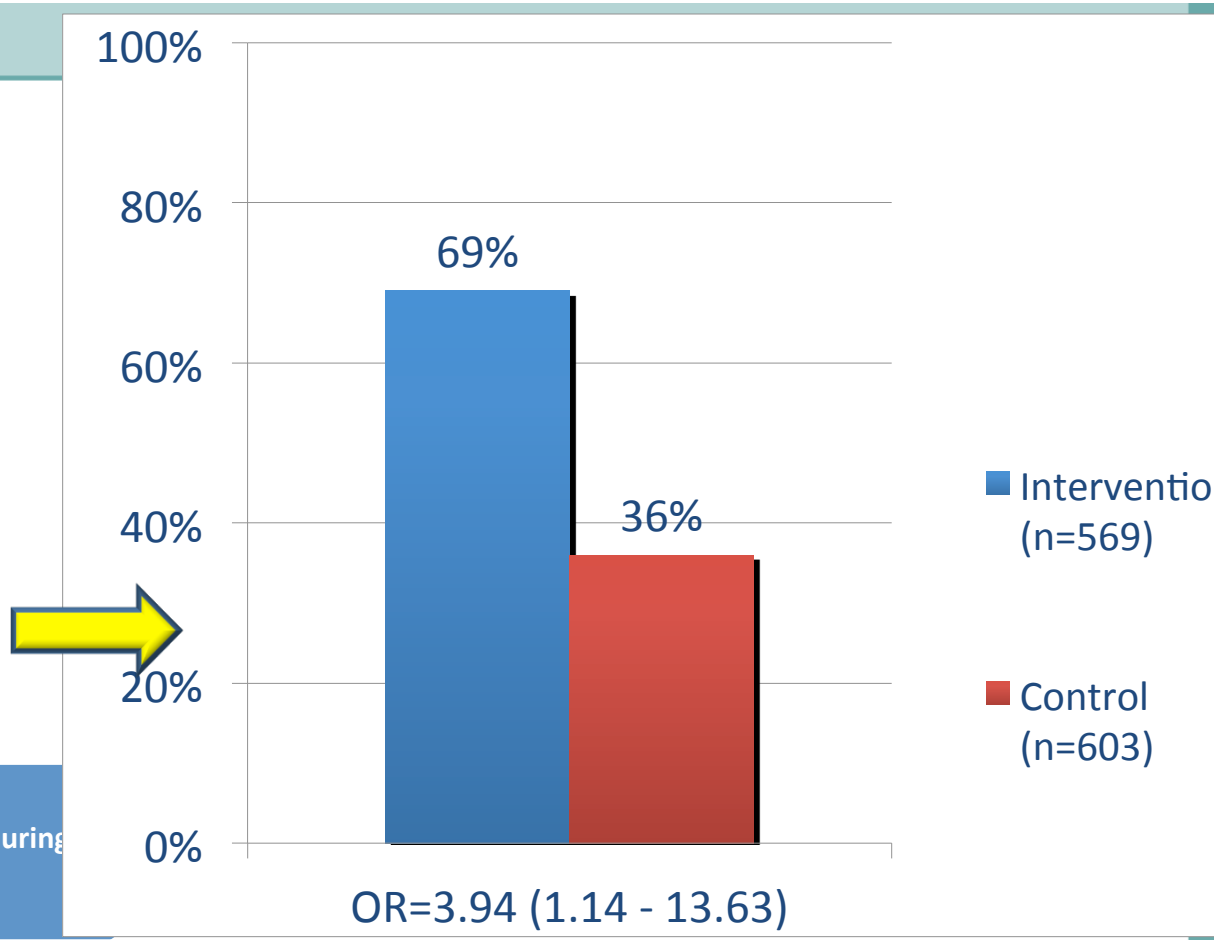
Be given ARVs

Enroll in HIV care and treatment

Adhere to ARVs during pregnancy

Deliver with skilled attendant and take ARVs

Bring infant for HIV testing



Median time to enrollment in HIV care:

- Intervention sites: 0 days
- Control sites: 8 days
  - HR = 2.2 (1.62-3.01)

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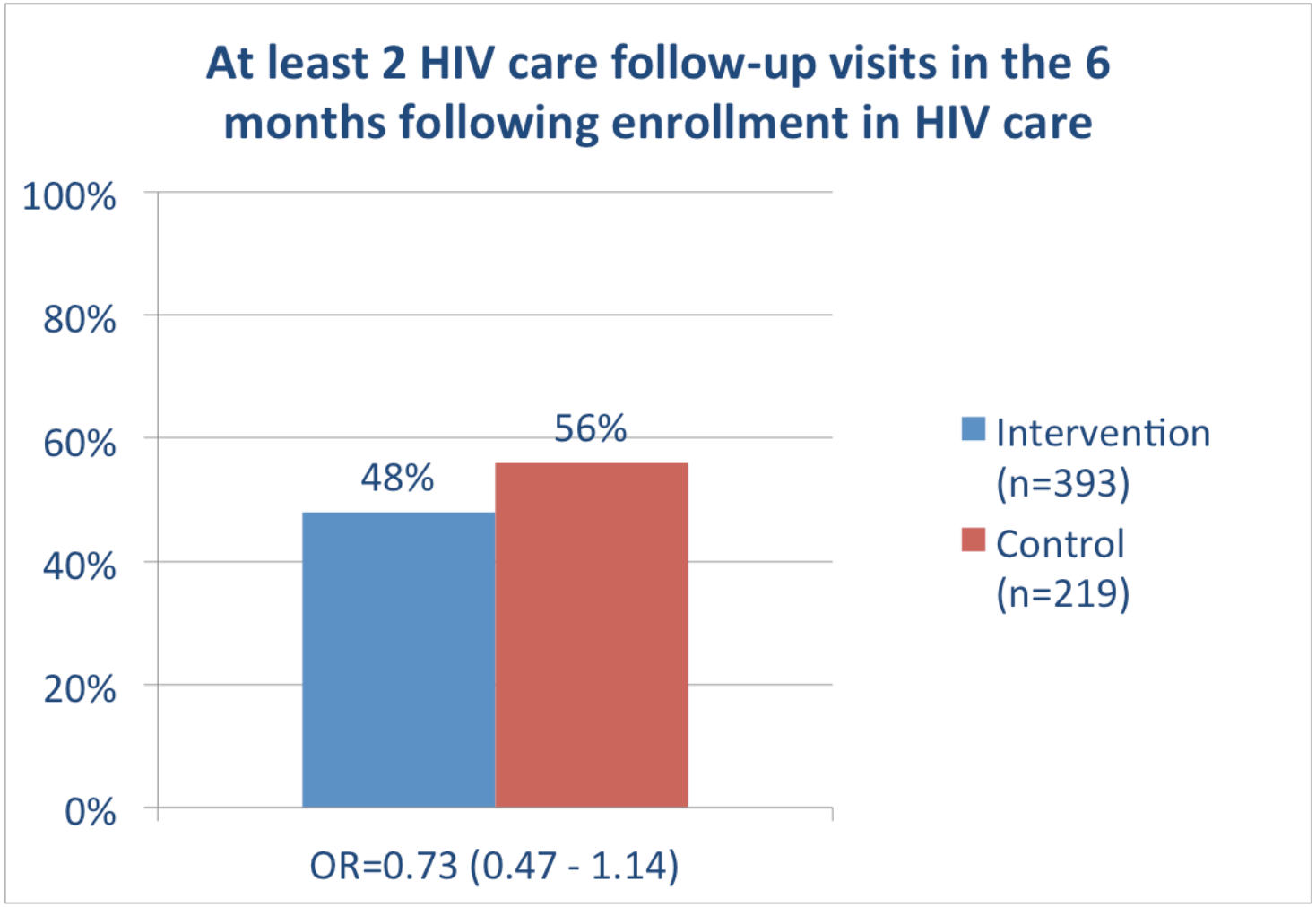
Retention in Care among Enrolled Women



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Get baseline CD4

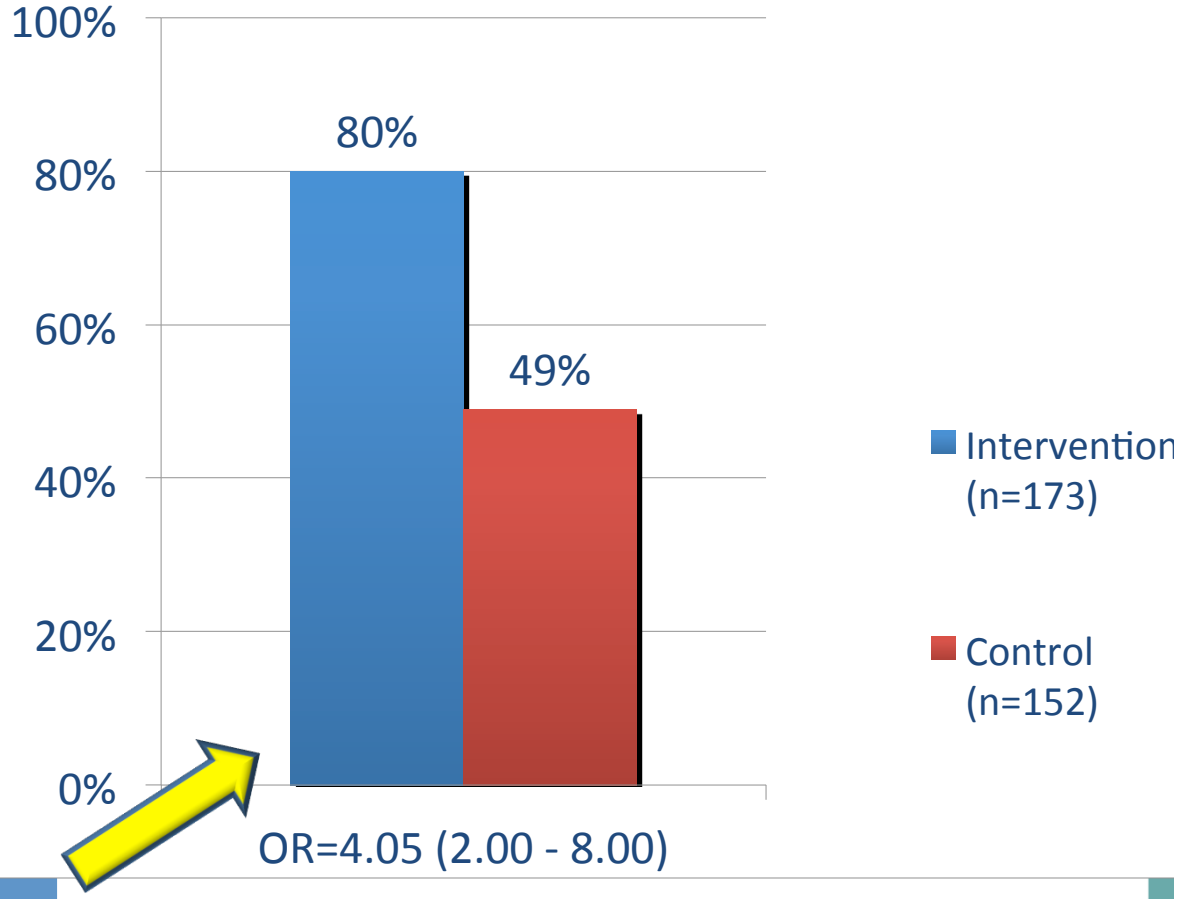
Be given ARVs

Enroll in HIV care and treatment

Adhere to ARV during pregnancy^

Deliver with skilled attendant and take ARVs

Bring infant for HIV testing



^Self report from women with postpartum forms (n=325)

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Get baseline CD4

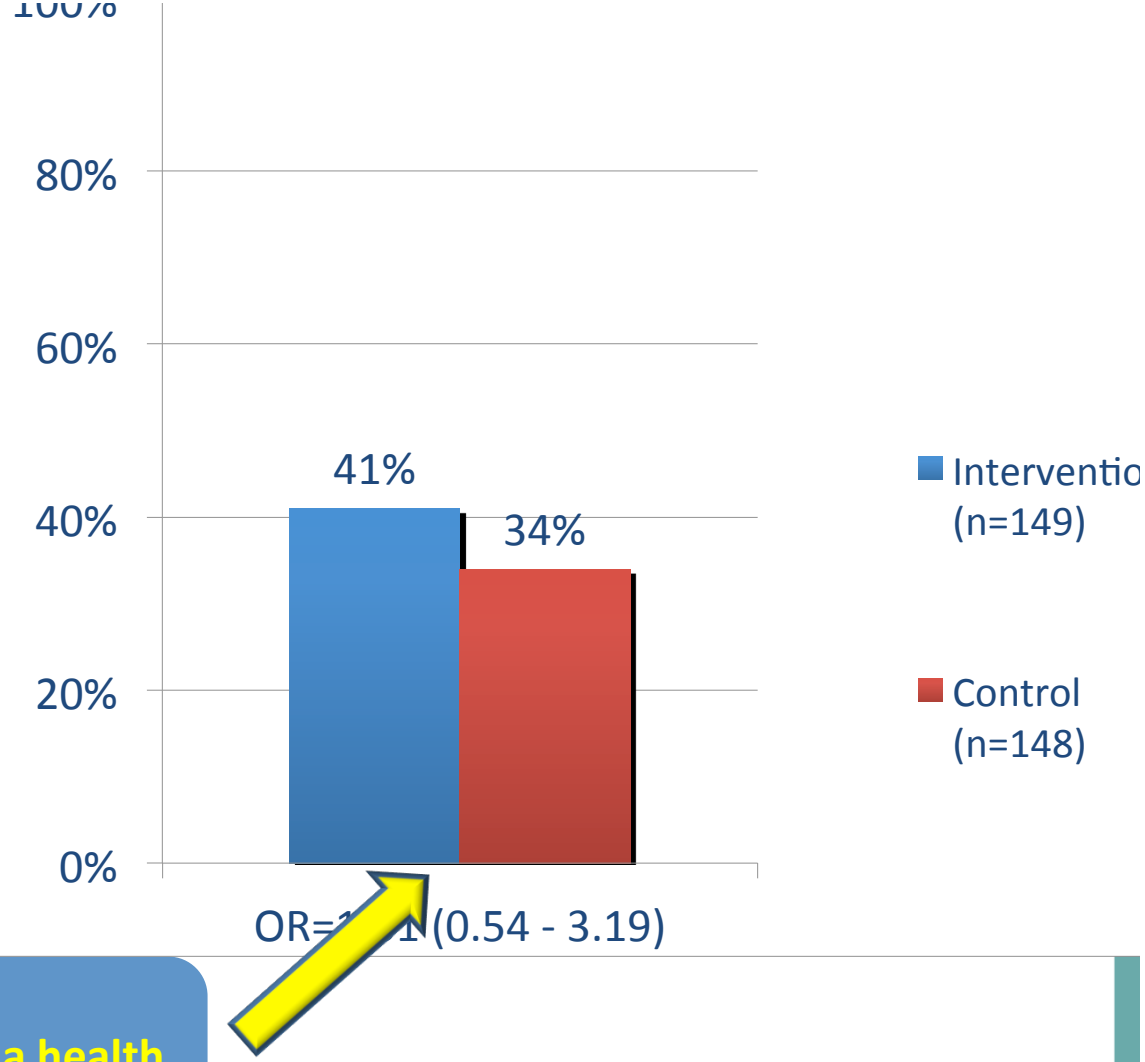
Be given ARVs

Enroll in HIV care and treatment

Adhere to ARVs during pregnancy^

Delivery in a health facility^

Bring infant for HIV testing



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Get baseline CD4

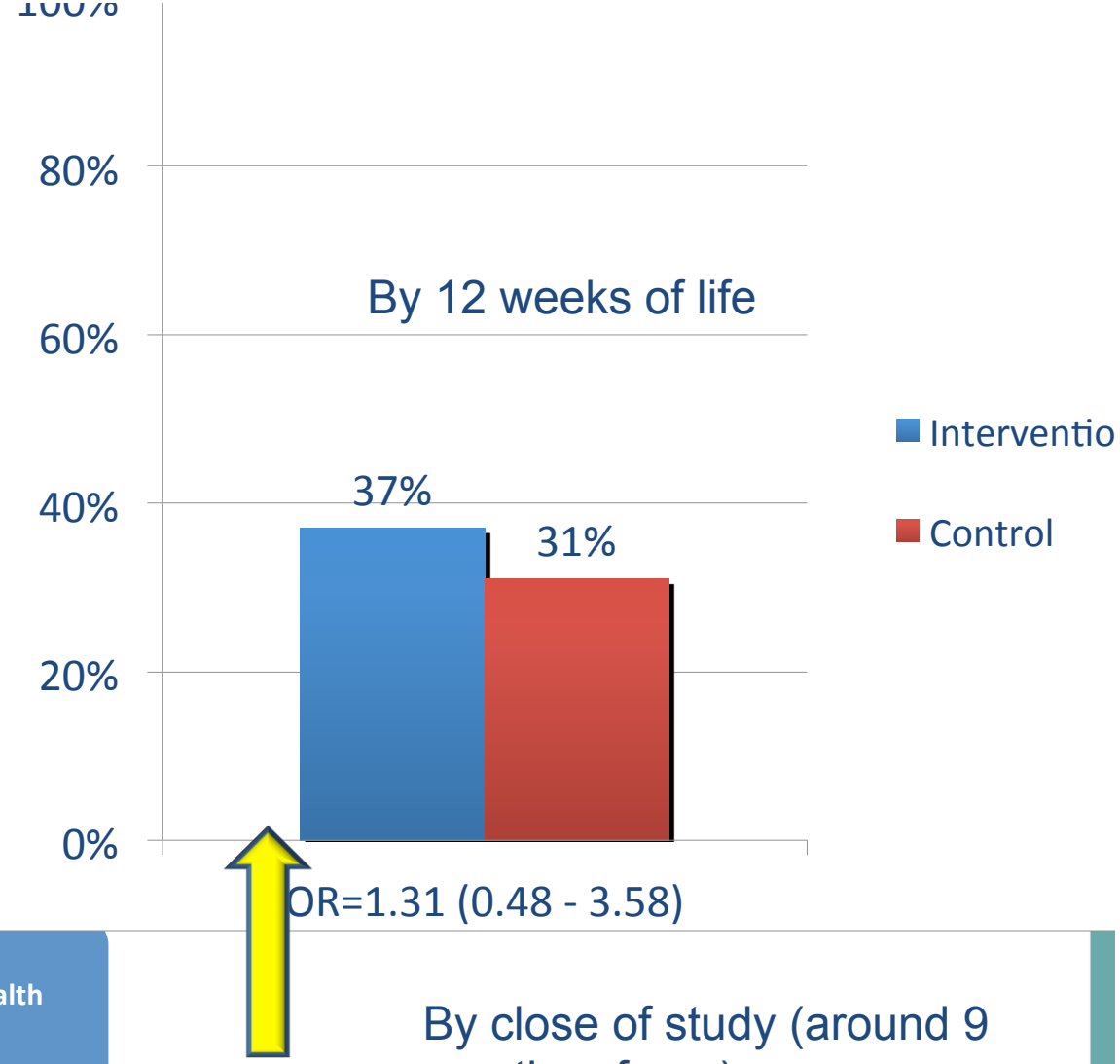
Be given ARVs

Enroll in HIV care and treatment

Adhere to ARVs during pregnancy^

Delivery in a health facility^

Infant HIV testing



By close of study (around 9 months of age):

- Intervention: 67%
- Control: 56%

OR= 1.60 (0.75-3.39)

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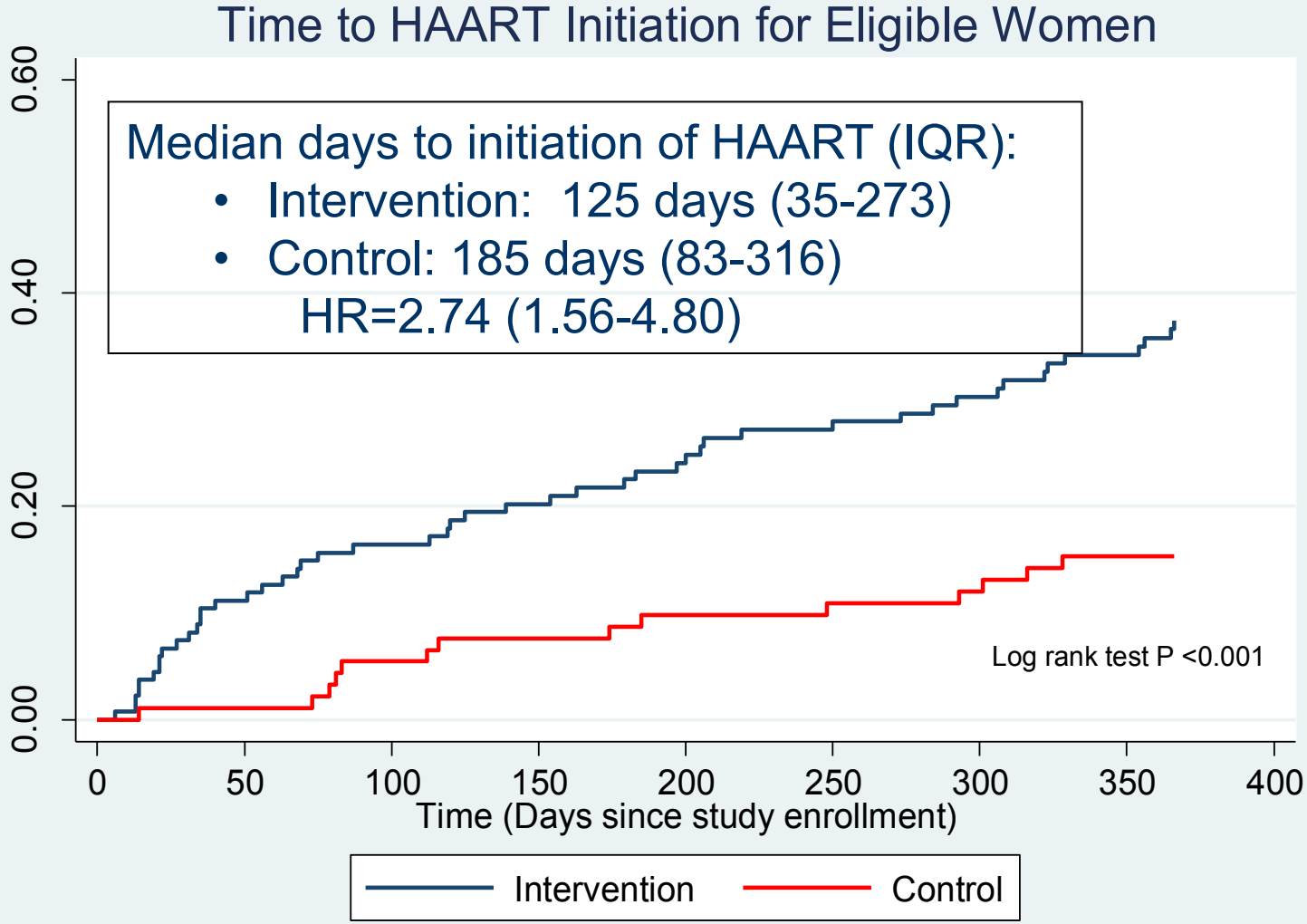
Time to HAART Initiation Among Eligible Women



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Maternal Outcomes

	Intervention N (%)	Control N (%)	Adjusted OR	95% CI
Composite clinical or immunologic progression to AIDS	10 (4.9)	7 (5.1)	0.83	0.41-1.68
Lost to Follow up (LTFU)	147 (25.8)	200 (33.2)	0.74	0.37-1.51
Maternal Death – N (%)	9 (1.6)	8 (1.5)	1.19	0.43-3.29
Composite LTFU or Death	156 (27.4)	208 (34.5)	0.76	0.40-1.44

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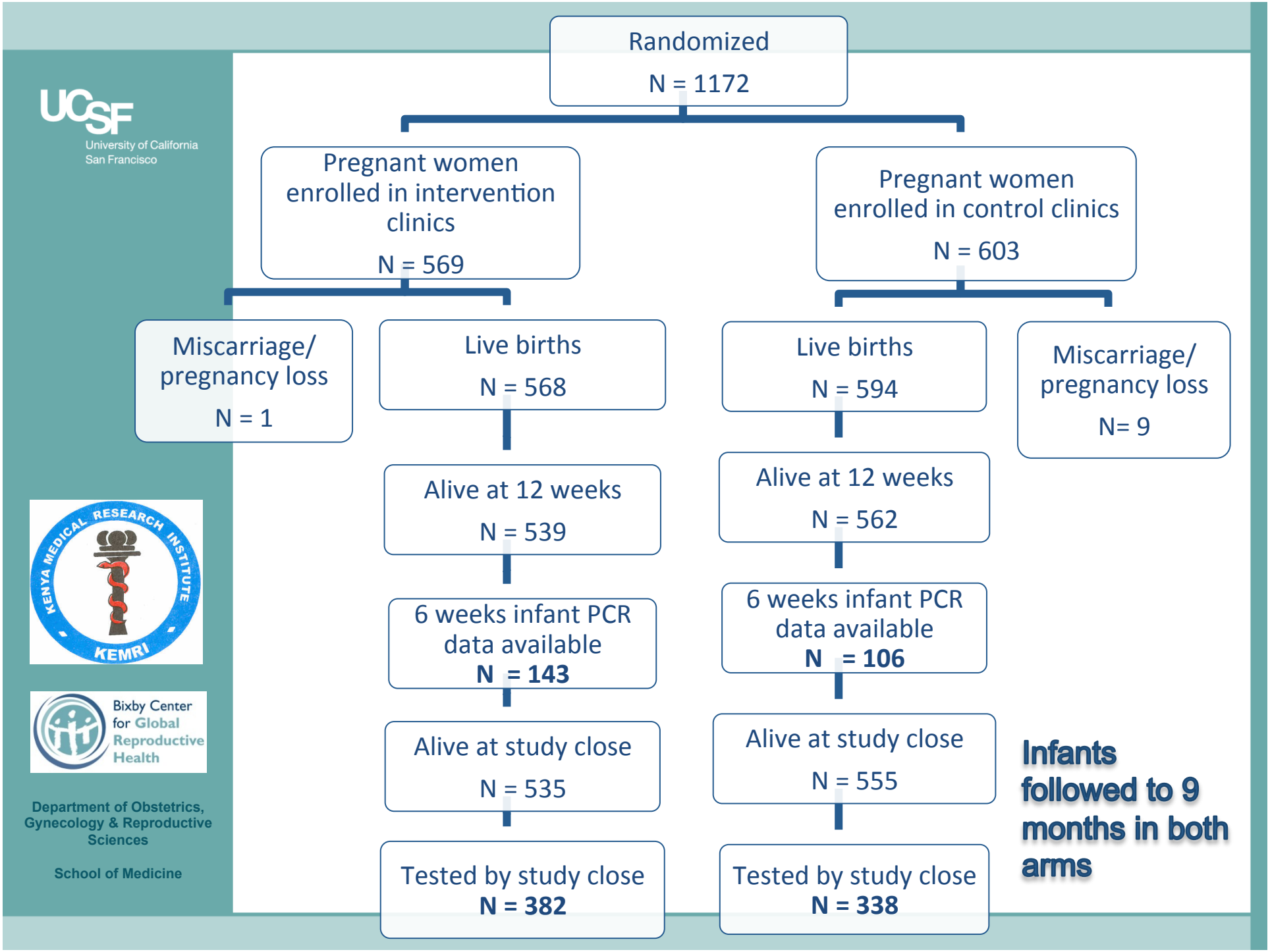
Randomized
N = 1172
Pregnant women enrolled in intervention clinics
N = 569
Pregnant women enrolled in control clinics
N = 603
Miscarriage/ pregnancy loss
N = 1
Live births
N = 568
Live births
N = 594
Miscarriage/ pregnancy loss
N= 9
Alive at 12 weeks
N = 539
Alive at 12 weeks
N = 562
6 weeks infant PCR data available
N = 143
6 weeks infant PCR data available
N = 106
Alive at study close
N = 535
Alive at study close
N = 555
Tested by study close
N = 382
Tested by study close
N = 338
Infants followed to 9 months in both arms
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Infant Outcomes

	Intervention N (%)	Control N (%)	Adjusted OR	95% CI
Total exposed infants (All live births)	568 (99.8)	594 (98.5)	10.76	(1.14-101.85)
Infant Exclusively breastfed^	70 (58)	69 (58)	1.10	(0.61-2.01)
HIV infected at 6 weeks PCR test	6 (4.2)	7 (6.6)	0.62	(0.20-1.90)
HIV infected by end study period (by 9 months)	28 (7.3)	27 (8.0)	0.89	(0.56-1.43)

^Self report from women with postpartum forms (n=325)

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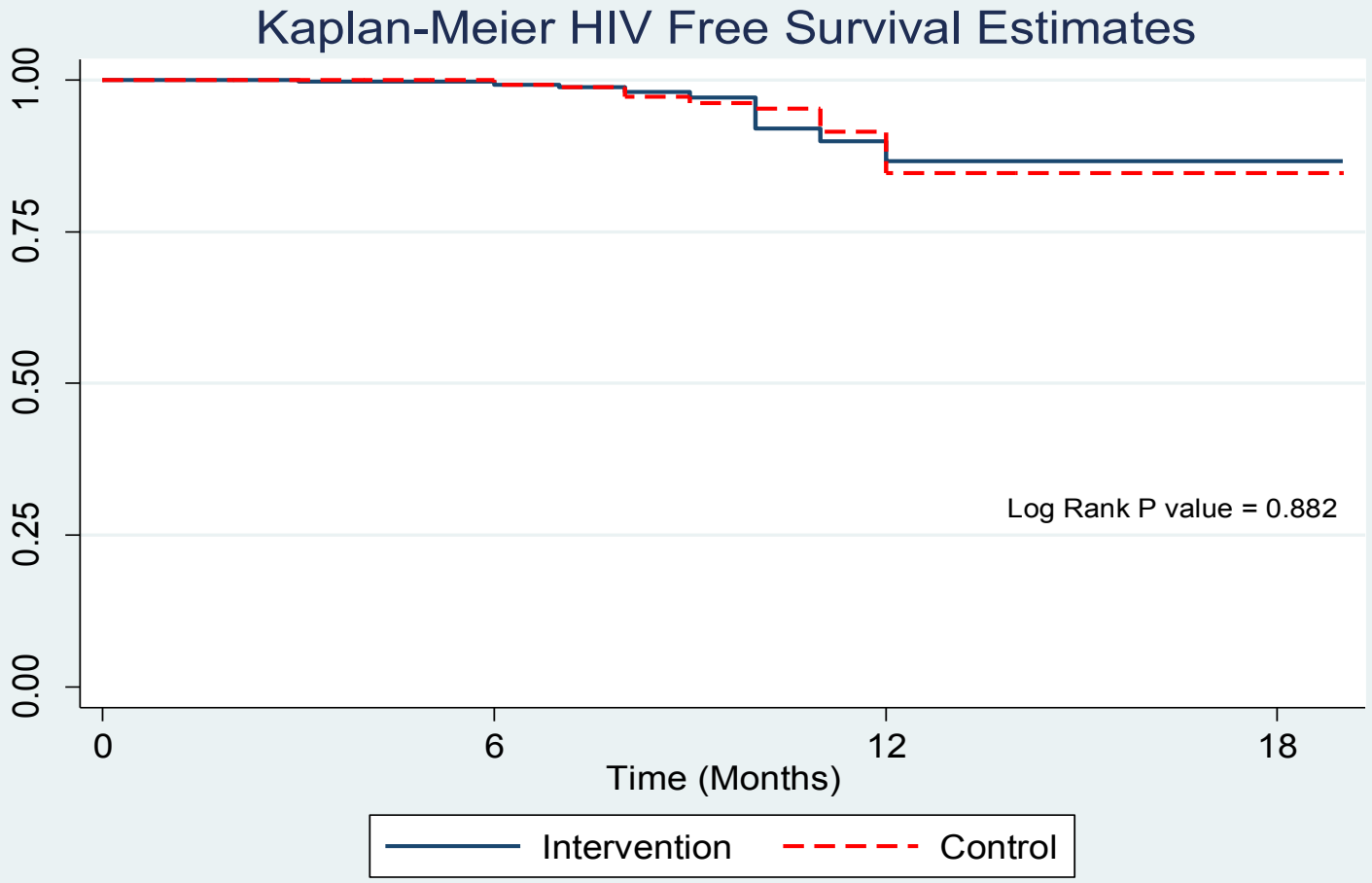
HIV Free Survival Among Exposed Infants



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Conclusions

- Results indicate strong positive effects of integration on:
  - Women's timely enrollment in HIV care
  - Use of ARVs during pregnancy
- Early infant diagnosis remained a challenge in both study arms

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Conclusions: Outcomes

- Integration was not associated with a reduced risk of MTCT
- In the short term, there was no difference in maternal health outcomes
- Integration of HIV services into the ANC clinic resulted in earlier initiation of HAART in eligible patients
- Important lessons for roll-out of WHO Option B+
  - Systems strengthening
    - Enrollment
    - Follow-up to support adherence and retention
    - Tracing and community linkages
  - Move towards immediate initiation of HAART models
  - Stigma reduction

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