

# Antiretroviral-Based HIV Treatment and Prevention Strategies: Advancing Science into Practice

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Prevention Adherence  
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*Sex, Drugs, and  
Rock and Roll in  
HIV Prevention*

# Disclosures

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- No antiretroviral medication is currently labeled for prevention of sexual transmission of HIV
- I have received research funding related to PrEP, antiretroviral treatment for HIV prevention, and microbicides from the US National Institutes of Health and the Bill & Melinda Gates Foundation.
- For some research studies, medication has been donated by Gilead Sciences.
- I have no other financial conflicts of interest.

# Preface

- 30 years into the HIV epidemic, new research has demonstrated that we now have powerful interventions to prevent new infections
- For the first time, there is rational discussion not just that we can fight HIV, but we stop transmission, on a large scale



# Outline

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## **SCIENCE**

Rationale and proof of antiretrovirals for HIV prevention  
*Sex, Drugs, and Rock and Roll*

## **PRACTICE**

Transitioning from scientific discovery into public health practice – challenges and opportunities  
*Drugs, Sex, and Getting to Work*

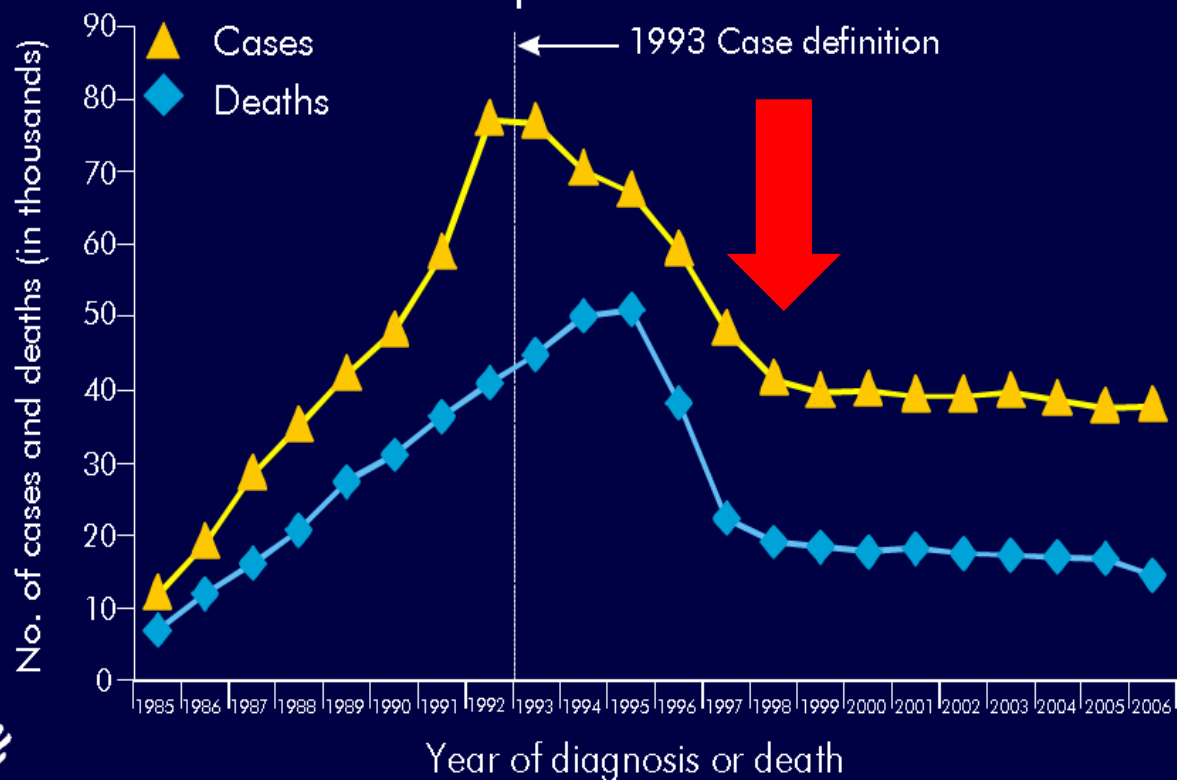
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Advancing **Science** into Practice

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# Starting point: antiretroviral medications revolutionized HIV care – US

Estimated Number of AIDS Cases and Deaths among Adults and Adolescents with AIDS, 1985–2006—United States and Dependent Areas

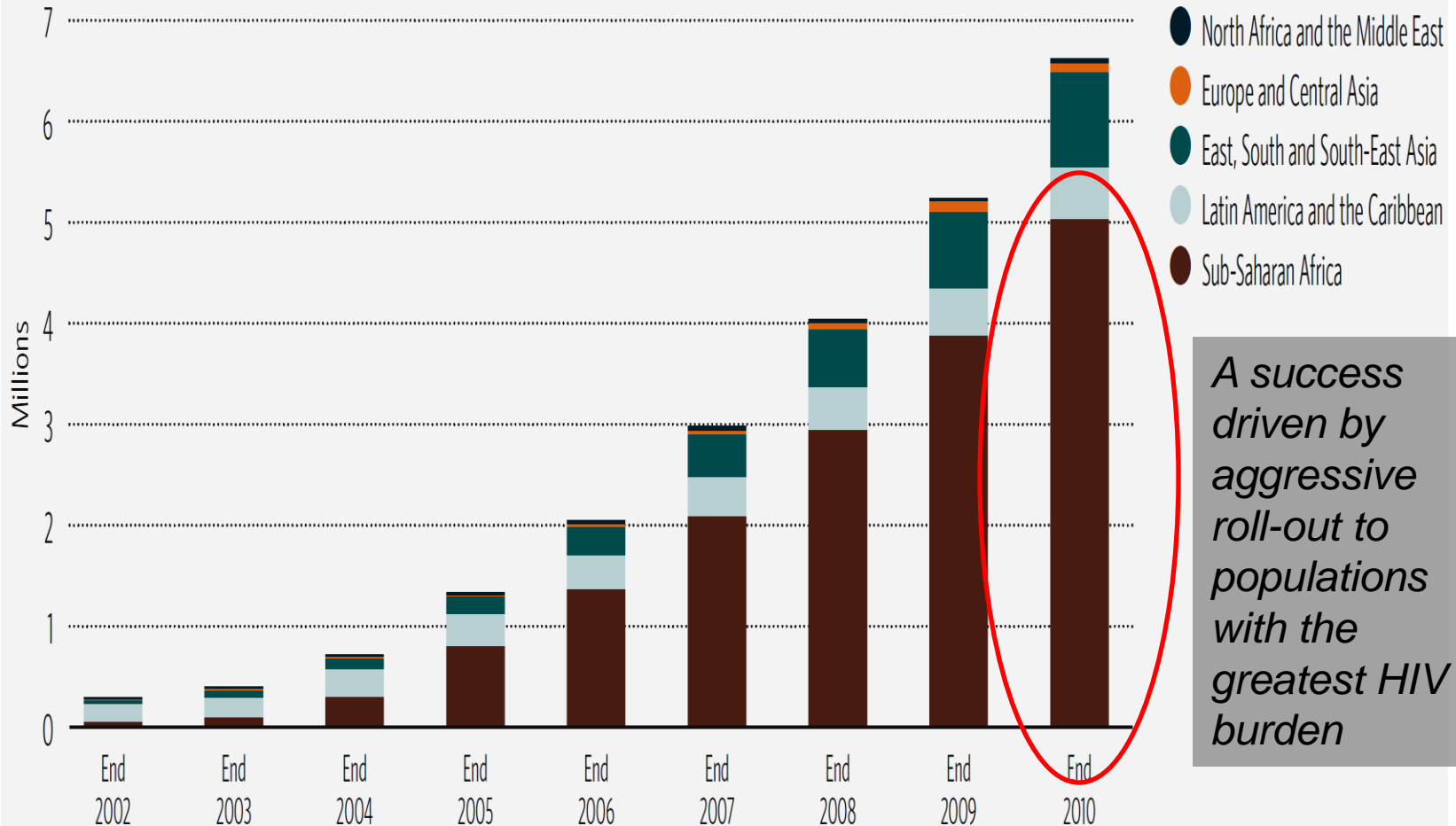


Note. Data have been adjusted for reporting delays.



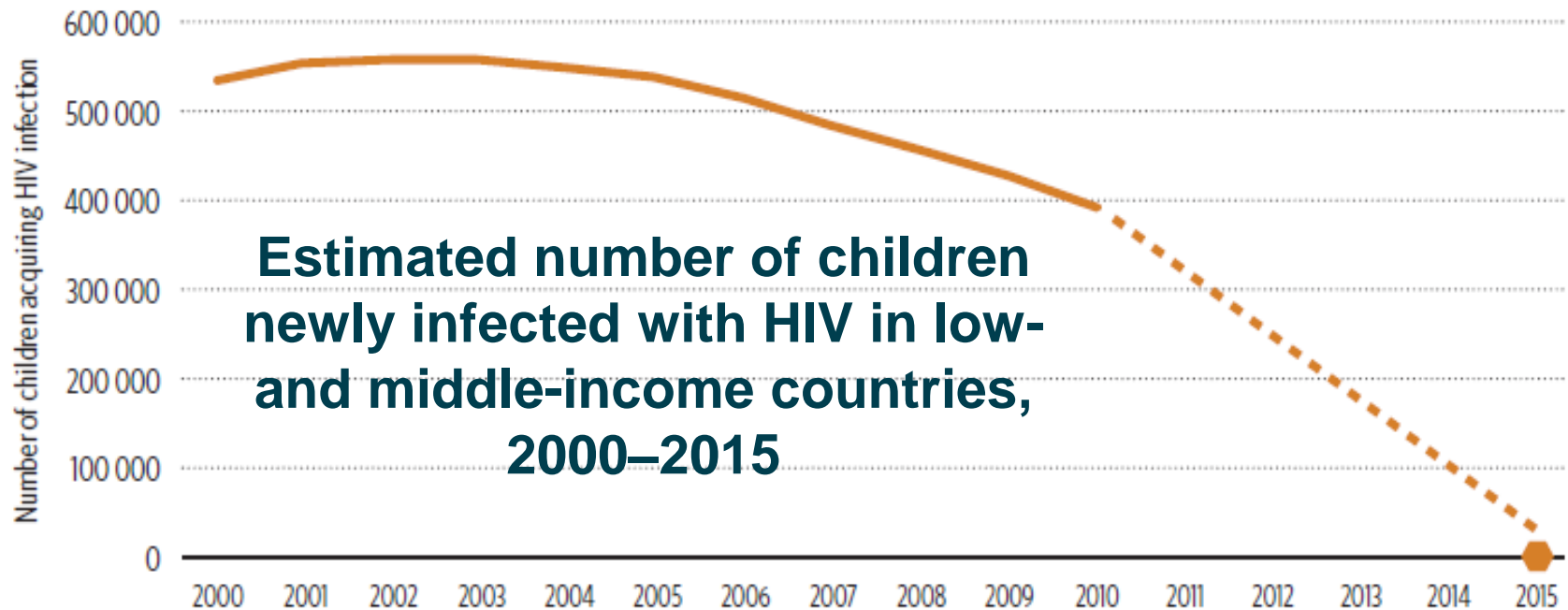


# Global scale-up of antiretroviral treatment is a public health success



# PMTCT = antiretrovirals as treatment and prophylaxis

The tremendous success of PMTCT in many way presages ART and PrEP for prevention of sexual transmission

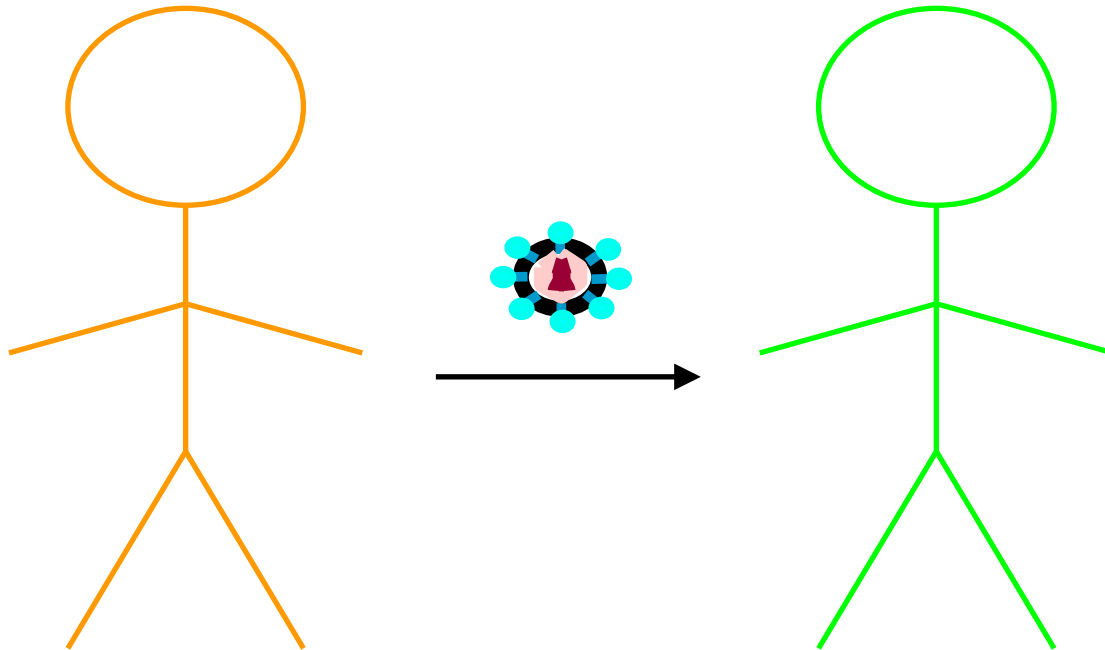


# Sex

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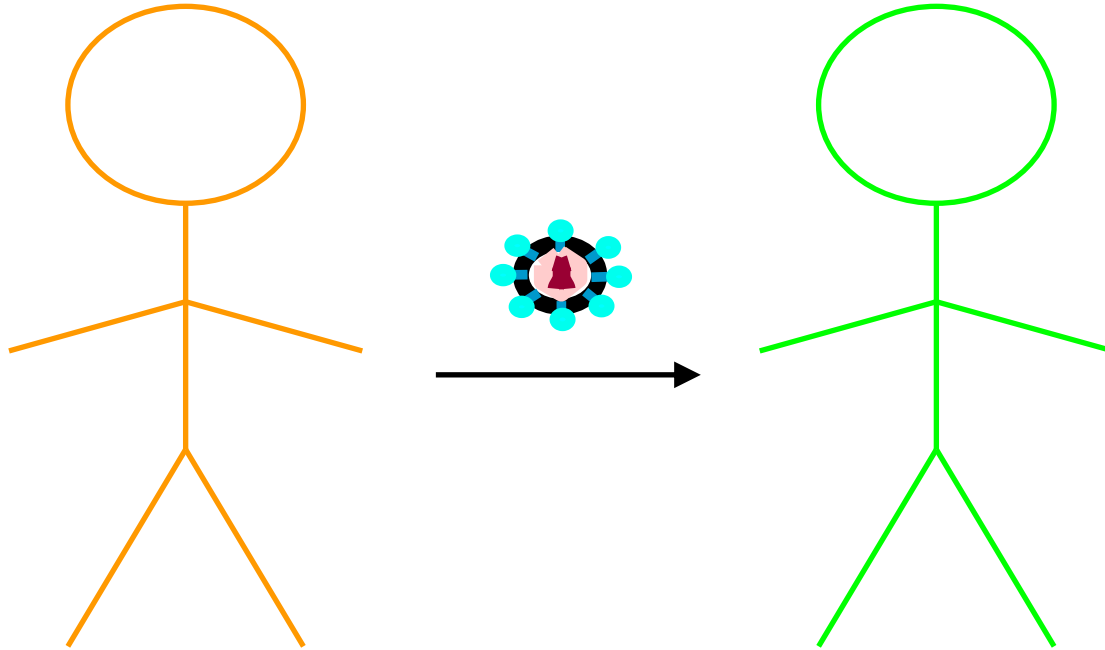
# Sex

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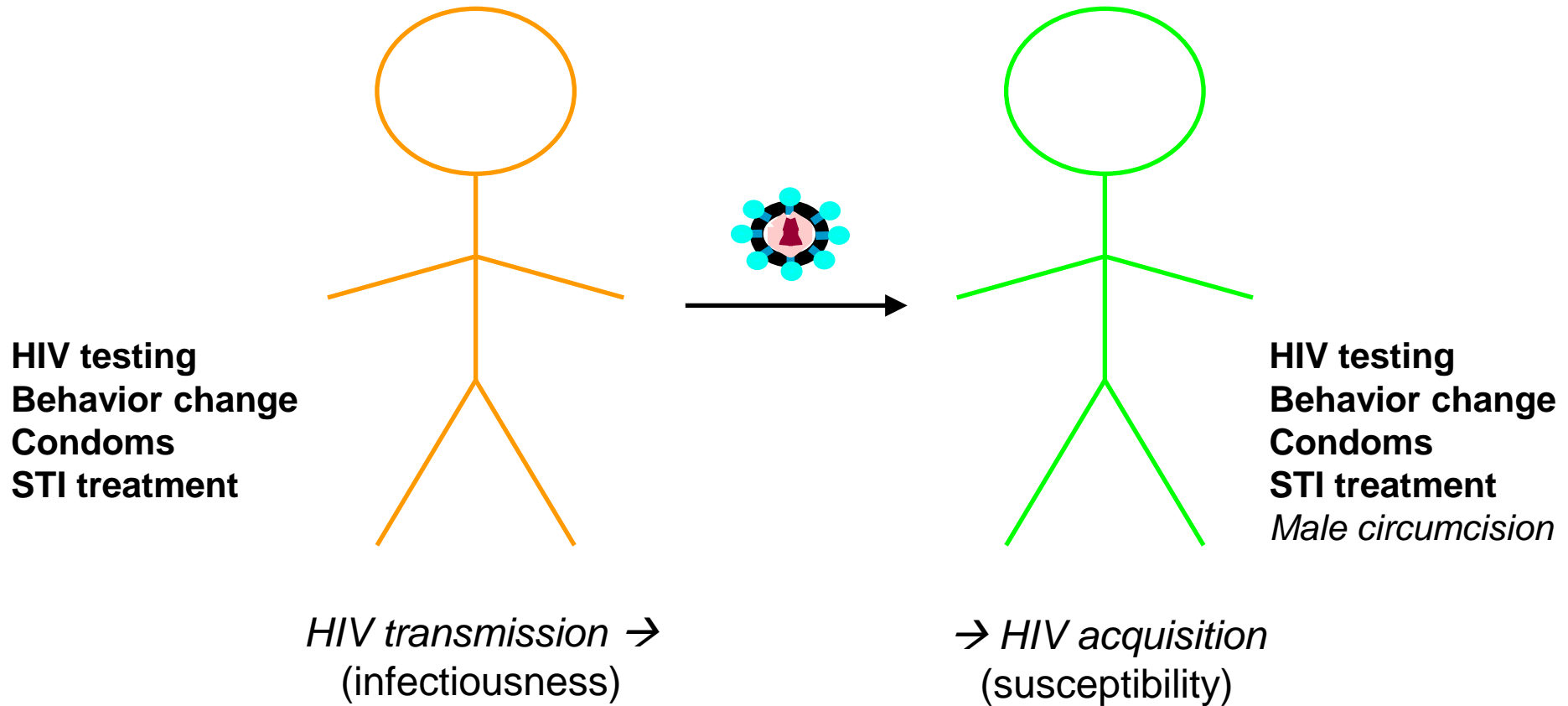


# Sex

***It is 9 am – this is the best that can be depicted for this slide***

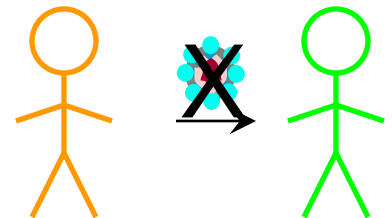
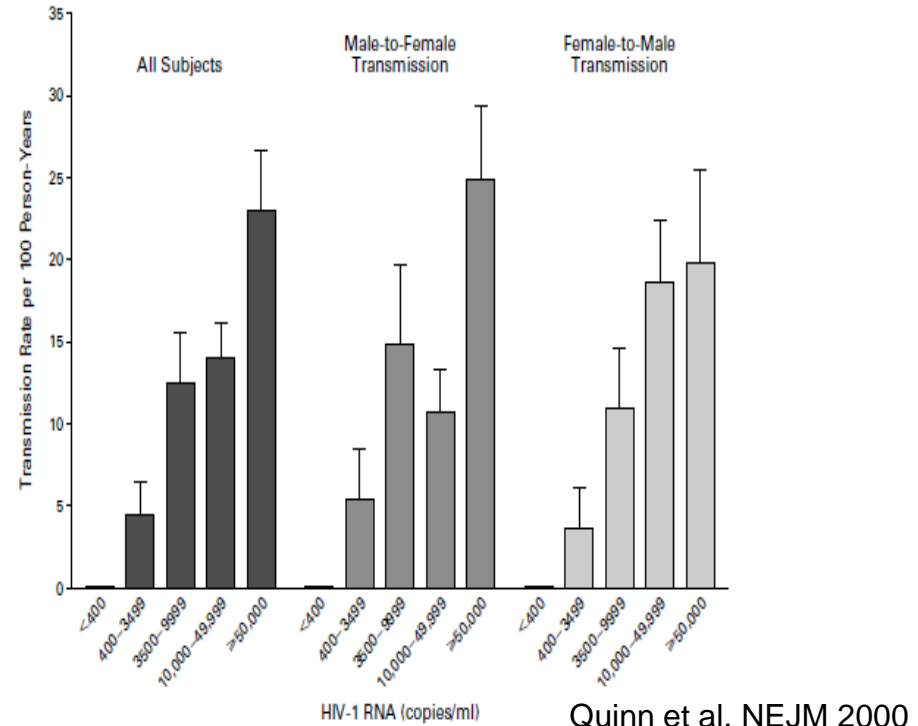


# Fundamental principles of interventions for prevention of sexual HIV transmission



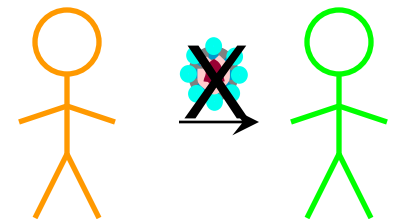
# Antiretroviral treatment for HIV prevention: building the hypothesis

- The quantity of HIV in plasma (& genital secretions) is the prime determinant of HIV transmission risk
- Initiation of antiretroviral therapy results in early and sustained reductions in plasma and genital HIV levels



# Antiretroviral treatment for HIV prevention

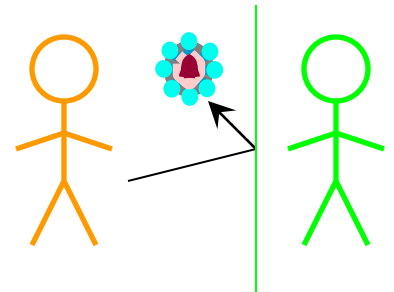
- *Hypothesis:* Treating HIV+ individuals with antiretroviral medications reduces their infectiousness and risk of transmission to partners.





# Pre-exposure prophylaxis (PrEP): the hypothesis

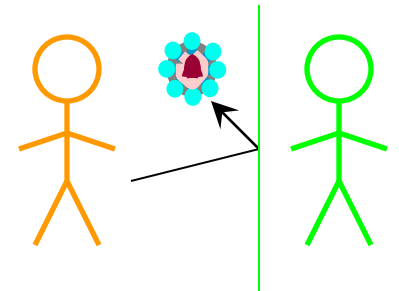
- In PrEP, an HIV uninfected individual uses an antiretroviral medication ahead of an HIV exposure. By having the antiretroviral in blood/tissues, PrEP may make it so that HIV is unable to establish infection.
- Analogous to prophylaxis for malaria in travelers.



# PrEP for HIV prevention



- *Hypothesis:* PrEP will reduce HIV susceptibility and risk of infection when taken by HIV- persons.



# Sex

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Antiretroviral treatment and PrEP were tested for prevention of sexual transmission of HIV based on strong scientific hypotheses.

# Drugs

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# Antiretroviral treatment for HIV prevention: evidence

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# Observational studies: ART and transmission in HIV serodiscordant couples

<b>Study</b>	<b>Rate Ratio (95% CI)</b>
Donnell 2010	0.08 [0.01, 0.57]
Melo 2008	0.10 [0.01, 1.67]
Reynolds 2011	0.10 [0.01, 1.64]
Sullivan 2009	0.21 [0.08, 0.56]
Del Romero 2010	0.21 [0.01, 3.75]
Musicco 1994	0.88 [0.36, 2.16]
Wang 2010	1.44 [0.85, 2.44]
<b>TOTAL</b>	<b>0.34 [0.13, 0.92]</b>



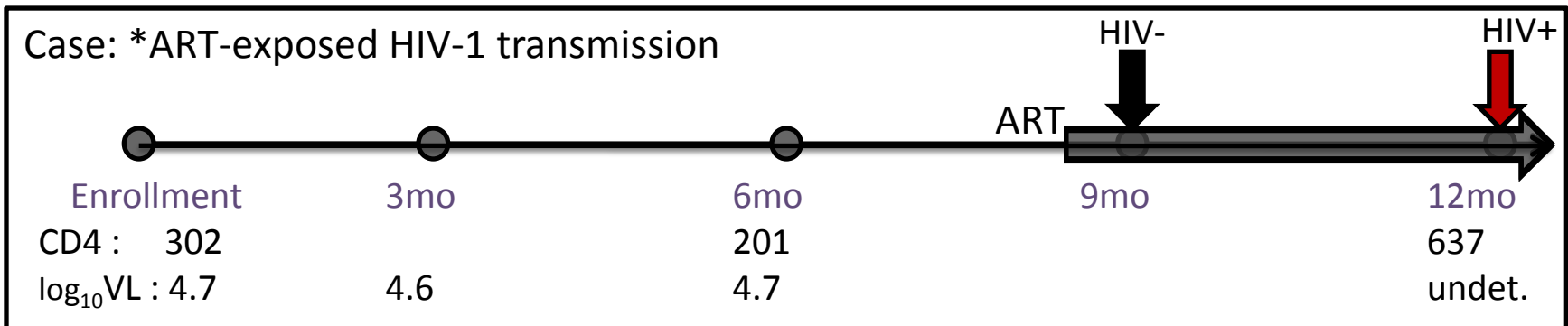
# ART and HIV-1 transmission: Partners in Prevention HSV/HIV Study

	Linked HIV infections	Person Years	Rate	95% CI
No ART initiated	102	4558	2.24	(1.84-2.72)
After ART initiation	1*	273	0.37	(0.09-2.04)

Unadjusted Relative Risk = 0.17 (95% CI 0.004, 0.94) , p = 0.037

**Adjusted\* Relative Risk = 0.08 (95% CI 0.002, 0.57), p = 0.004**

\* For time on study and CD4 count



Donnell et al. Lancet 2010



# HPTN 052: randomized clinical trial of immediate vs delayed ART in couples

Total HIV-1 Transmission Events: 39

Linked  
Transmissions: 28

Unlinked or TBD  
Transmissions: 11

Immediate  
ART: 1

Delayed  
ART: 27

$p < 0.001$

***96% reduction in  
HIV transmission  
(95% CI 73-99%)***





# PrEP for HIV prevention: evidence

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# Tenofovir-based PrEP



= FTC/TDF (co-formulated emtricitabine + tenofovir)  
sold under the trade name Truvada®  
It is a daily oral pill.

- ✓ **Potent:** Broad and potent activity (all HIV subtypes), rapidly active
- ✓ **Safe:** Favorable safety and tolerability, large experience as treatment
- ✓ **Easy:** Low pill burden, no food restrictions, few drug interactions
- ✓ **Evidence:** Animal models of PrEP showed high protection



# Two pivotal randomized, placebo-controlled trials of PrEP for HIV prevention

	<b>iPrEx</b>	<b>Partners PrEP</b>
<b>Population</b>	Men who have sex with men	Heterosexual HIV serodiscordant couples
<b>Location</b>	US, Brazil, Ecuador, Peru, South Africa, Thailand	Kenya, Uganda
<b>Sample size</b>	2499	4758
<b>Intervention</b>	Daily oral FTC/TDF	Daily oral FTC/TDF
<b>HIV protection due to PrEP (FTC/TDF)</b>	<b>44%</b> (95% CI 15-63%)	<b>75%</b> (95% CI 55-87%)



# Drugs

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Clinical trials provide clear and definitive evidence that antiretroviral treatment and PrEP work for the prevention of sexual transmission of HIV.



# Rock and Roll



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# Advancing Science into Practice

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# Challenges and opportunities

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Antiretroviral medications – as treatment and as prophylaxis – prevent HIV transmission. We face many challenges and opportunities about how these proven strategies can be put into practice.



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*After the sex, drugs, and rock and roll, bound to be some hangover...*





# Challenges and opportunities

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## Adherence

*Drugs*

## Adherence and risk behavior

*Sex*

## Uptake and public health implementation

*Getting to work*



# Adherence

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# Adherence and PrEP

- There is a clear relationship between PrEP use and HIV protection in clinical trials. Divergent PrEP trial results appear to be correlated with PrEP taking behaviors.
- **PREMISE:** PrEP cannot work if it is not taken.



# Divergent oral PrEP efficacy trial results

Study	Population	N	Results
iPrEx	MSM	2499	<b>44% efficacy FTC/TDF</b>
TDF2 Study	Young men and women	1200	<b>62% efficacy FTC/TDF</b>
Partners PrEP Study	Heterosexual couples	4758	<b>67% efficacy TDF</b> <b>75% efficacy FTC/TDF</b>
FEM-PrEP	Women	2021	<b>6% efficacy FTC/TDF</b>
VOICE	Women	3021 (oral arms)	<b>No efficacy TDF</b> FTC/TDF ongoing
Bangkok Tenofovir Study	IDUs	2400	TDF ongoing



# Adherence and efficacy in PrEP trials

	<b>% of blood samples with tenofovir detected</b>	<b>HIV protection efficacy in randomized comparison</b>
<b>Partners PrEP</b> FTC/TDF arm	81%	75%
<b>TDF2</b>	79%	62%
<b>iPrEx</b>	51%	44%
<b>FEM-PrEP</b>	26%	6%

**There is a clear dose-response  
between evidence of PrEP use & efficacy**



Donnell et al CROI 2012  
Grant et al N Engl J Med 2010  
Van Damme et al CROI 2012  
Paxton et al FDA 2012

# Tenofovir levels and HIV protection

- And when PrEP was taken (=detected in blood), protection was very high

	% with tenofovir detected	HIV-1 relative risk reduction: detection versus no detection of tenofovir	
		Protection	p-value
<b>iPrEx</b>	51%	92%	<0.001
<b>Partners PrEP FTC/TDF arm</b>	81%	90%	0.002



# Adherence and perfection

- Imperfect, but still regular adherence, might still provide substantial HIV protection, although PrEP is still as a daily medication

	<b>Estimated HIV risk reduction (95% CI)</b>
<b>2 doses/week</b>	76% (56-96%)
<b>4 doses/week</b>	96% (90->99%)
<b>7 doses/week</b>	99% (96->99%)

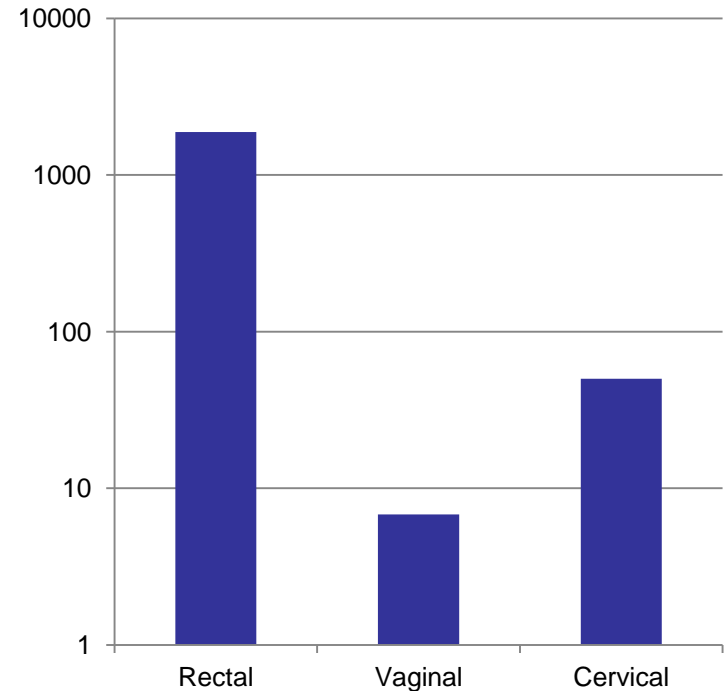
Anderson et al. CROI 2012



# Pharmacokinetics and PrEP adherence

- PK studies offered one possible mechanism for lower HIV protection in women: oral tenofovir results in >10x higher concentrations in rectal tissue than cervical and vaginal tissue.

Tissue tenofovir concentrations at 24 hours after a single dose of oral FTC/TDF



Patterson et al. Sci Transl Med 2012





# Partners PrEP Study: PrEP does work in high-risk subpopulations

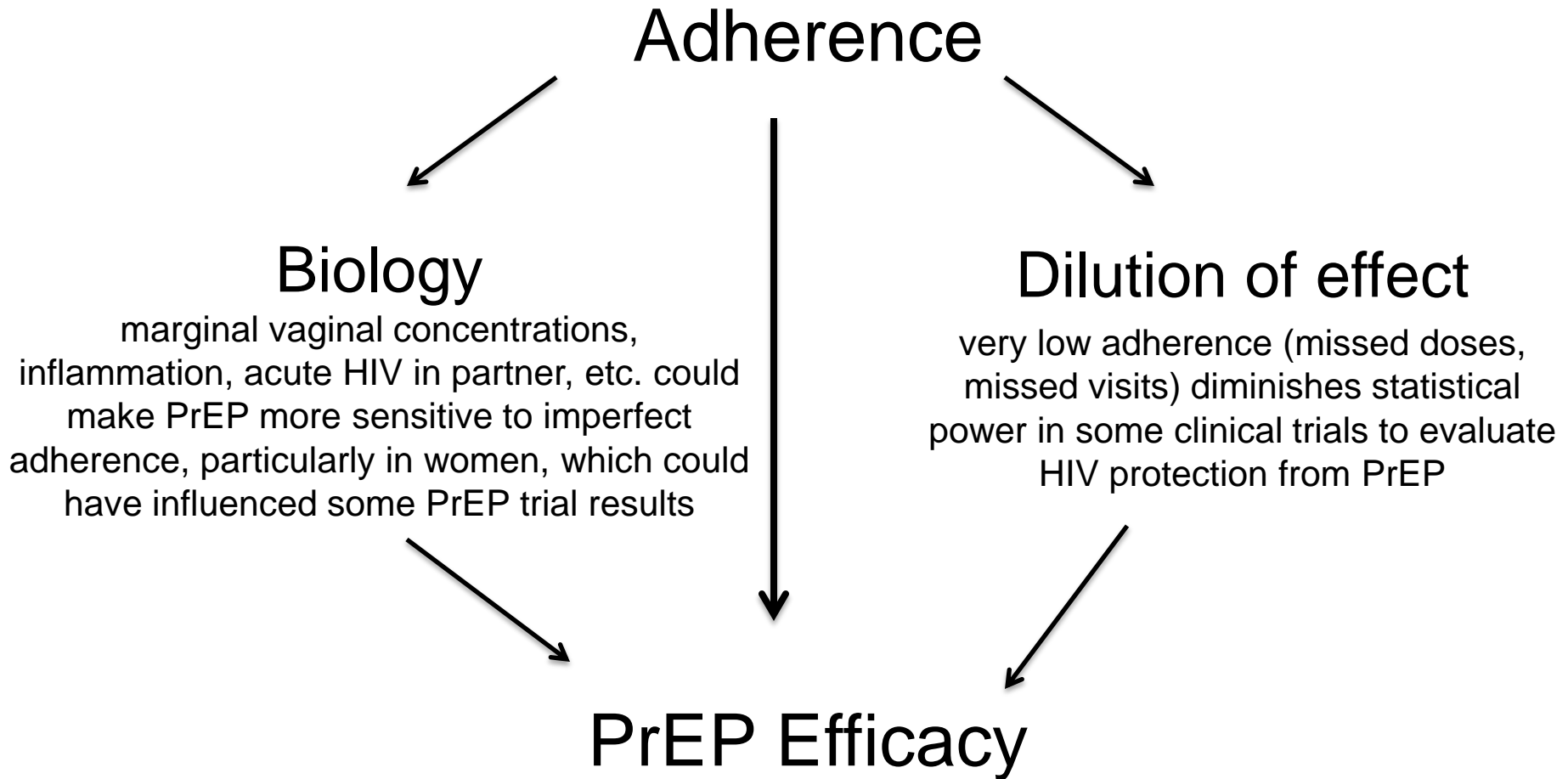
	Incidence placebo	FTC/TDF Efficacy	P-value
Overall	2.0	75%	<0.001
<b>Women</b>	2.8	66%	0.01
Couples w/ HIV+ partner had viral load $\geq 50,000$ c/mL	3.9	77%	0.008
Couples with key high-risk characteristics*	5.0+	78%	0.006



Baeten et al CROI 2012 Abstract 29

\*Kahle et al CROI 2012 Abstract 1102 and unpublished

# Divergent PrEP trials: it stems from adherence



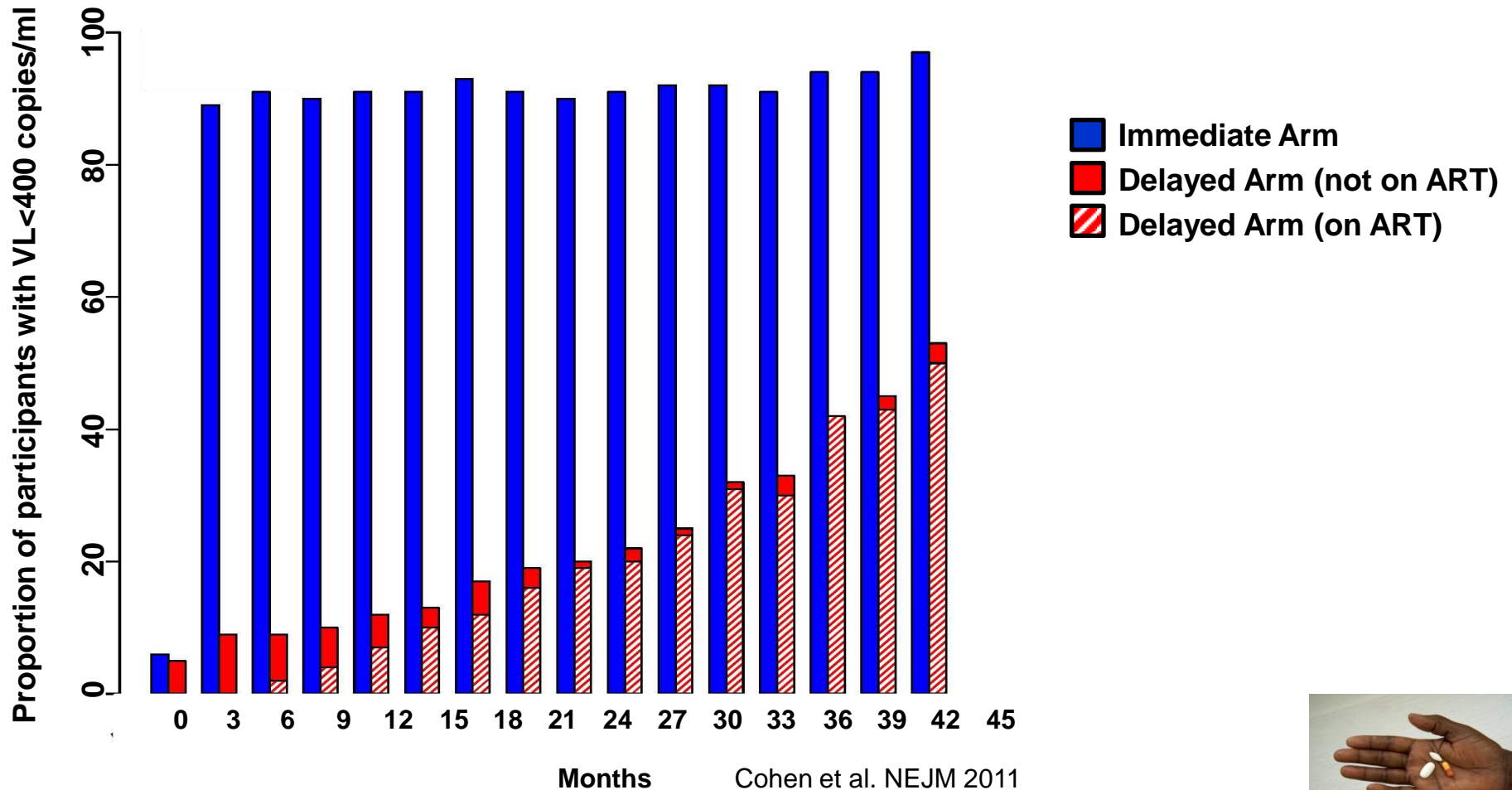
# Adherence and antiretroviral treatment

- In a way very similar to PrEP, antiretroviral treatment requires high adherence in order to achieve prevention benefits.
  - *Viral suppression is the biologic pathway to efficacy*
  - *The results from HPTN 052 are very clear in this regard – and were an optimized test of the biologic hypothesis that ART diminishes HIV infectiousness*



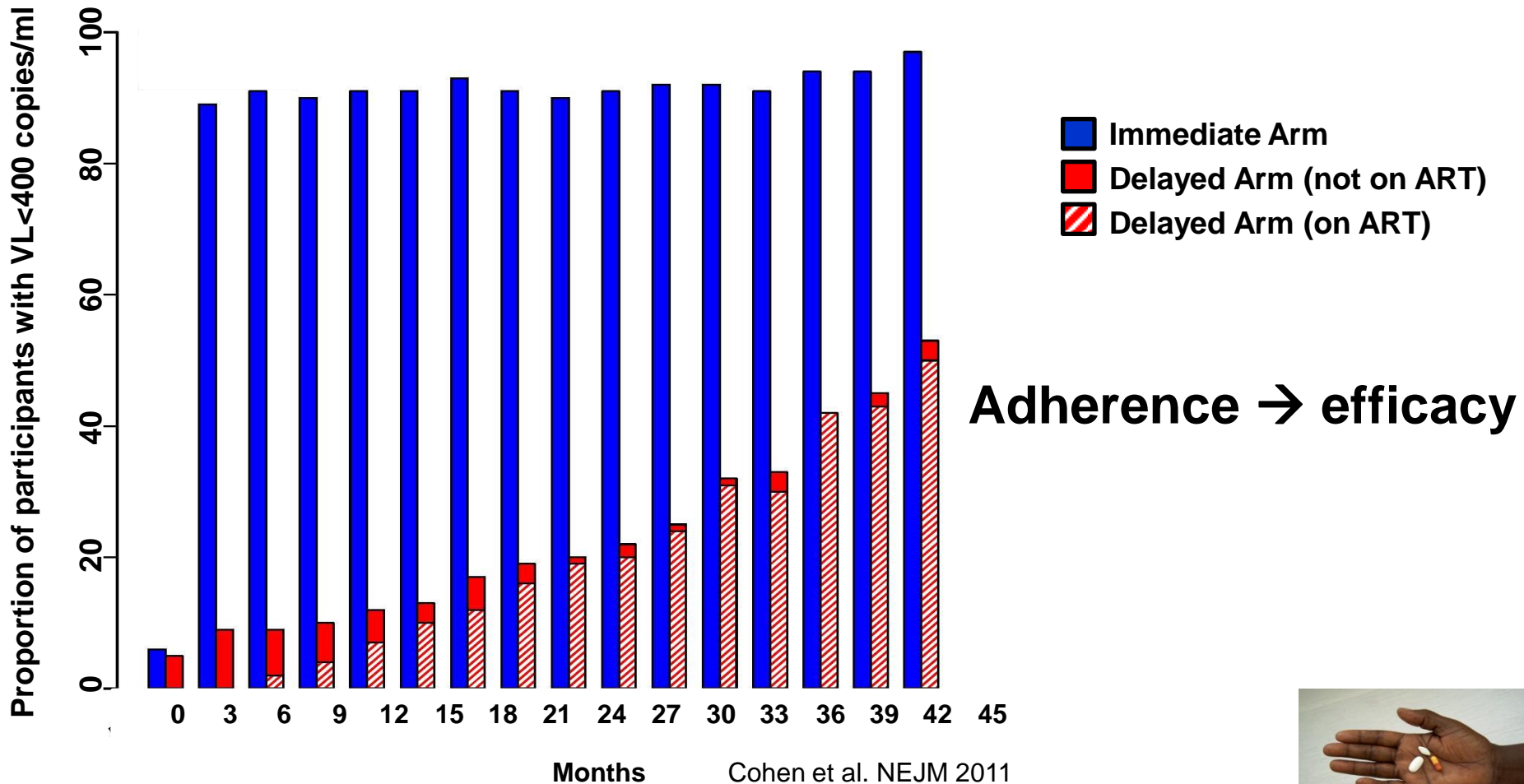
# Adherence and HPTN 052

In HPTN 052, viral suppression was near-universal, reflecting intensive strategies to achieve near-perfect adherence



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# Putting this all together

	<b>Antiretroviral treatment for HIV prevention</b>	<b>PrEP for HIV prevention</b>
<b>HIV prevention effect with high adherence</b>	<b>96%</b>  (HPTN 052, near-perfect adherence)	<b>90-92%</b>  (Tenofovir levels in iPrEx and Partners PrEP)

Two incredibly powerful prevention strategies – when adherence is high





7th International  
Conference on  
**HIV TREATMENT  
AND PREVENTION  
ADHERENCE**

# Adherence Matters (*Drugs*)



# Adherence, adherence behavior, and risk behavior (sex)

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# Adherence, adherence behavior, and risk behavior

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For PrEP:

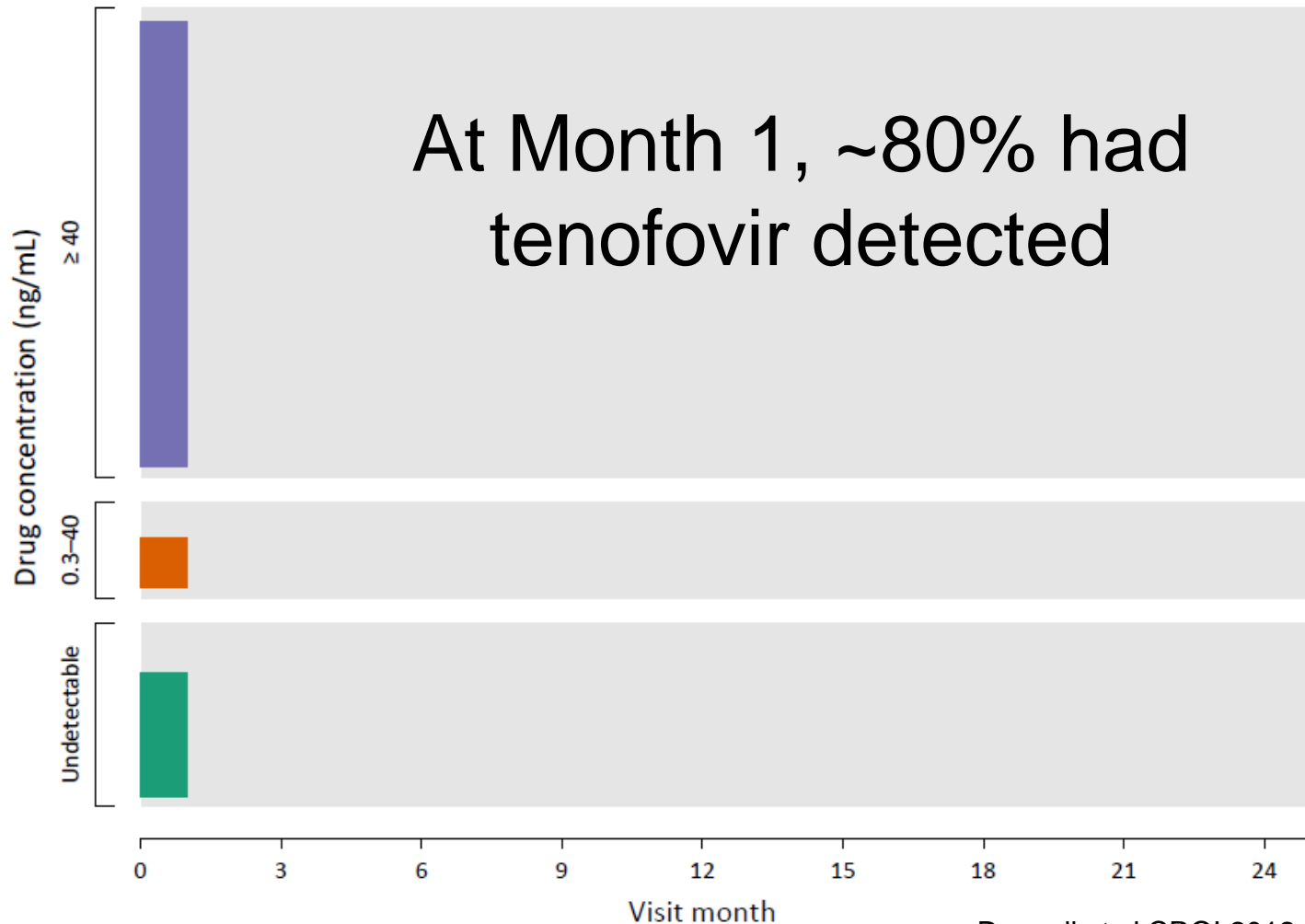
What do adherence patterns look like in PrEP trials?

What does that mean for implementation?

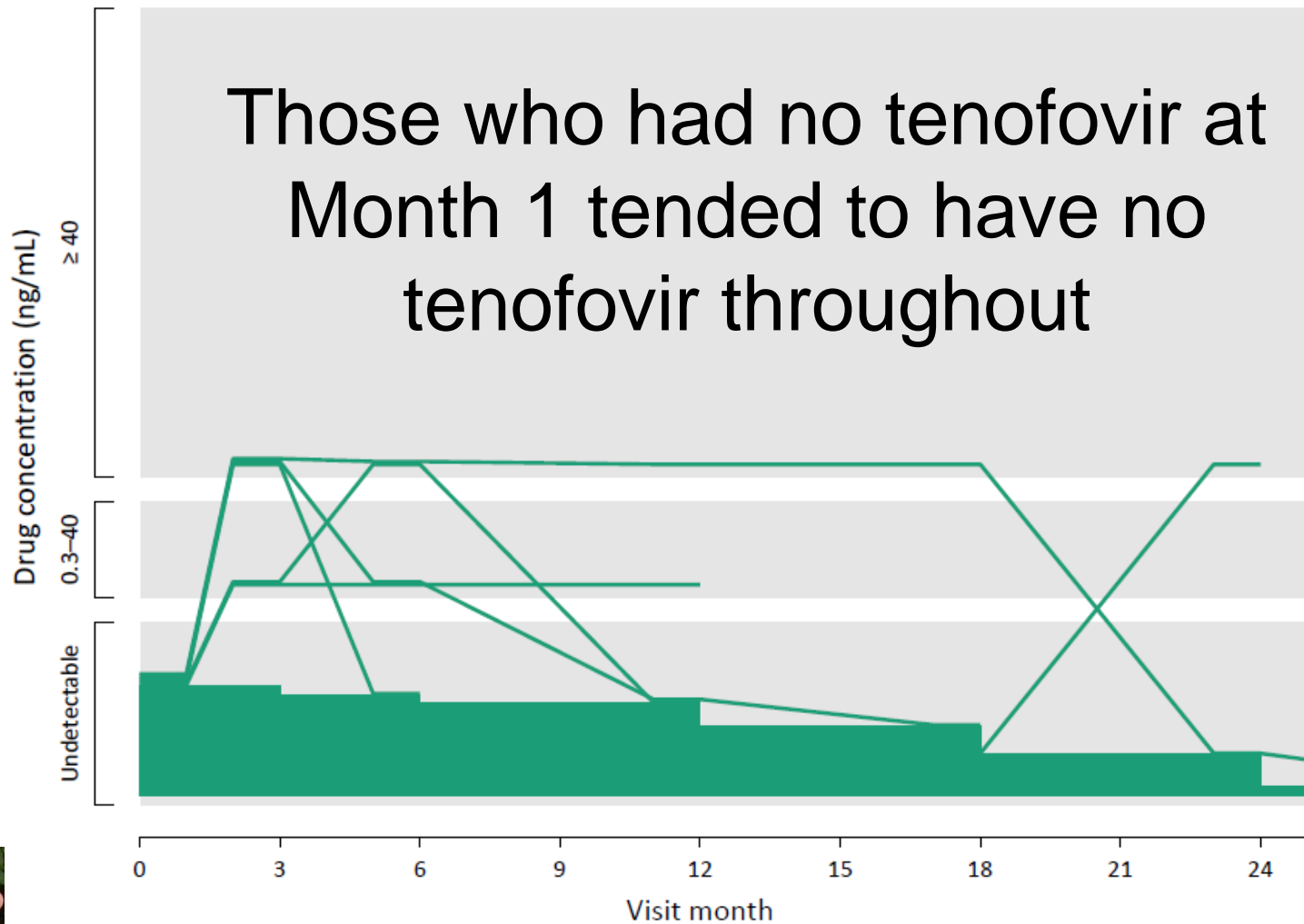
How does adherence relates to risk?



# Sustained use (and non-use) of PrEP: Partners PrEP Study



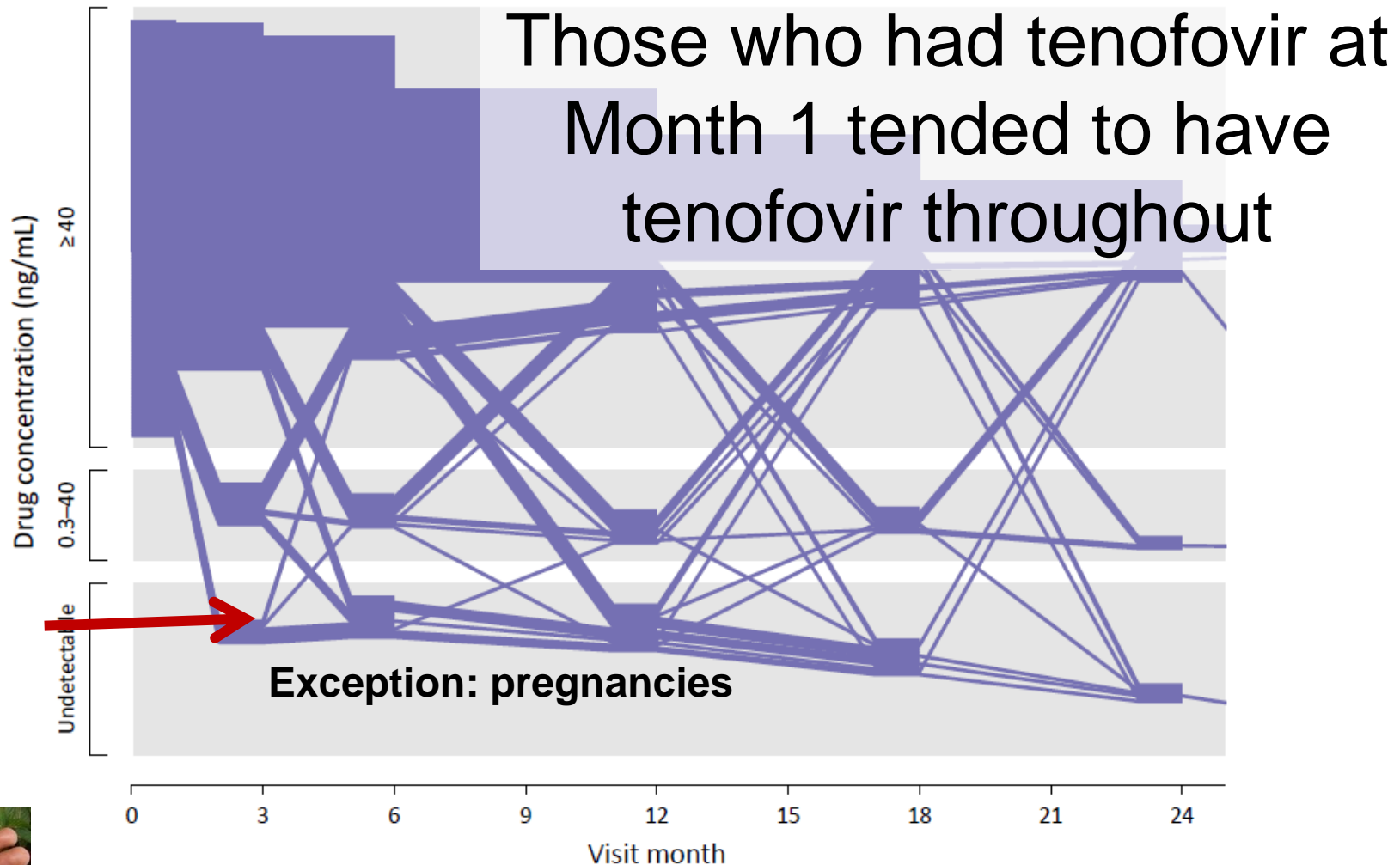
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Donnell et al CROI 2012



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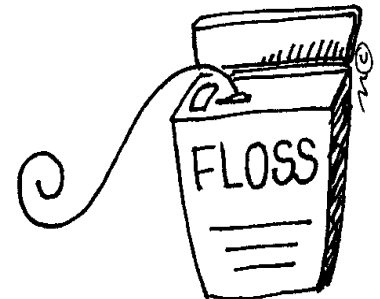


Donnell et al CROI 2012



# Adherence and habit

- In contrast to clinical trials, which followed every person randomized regardless of continued interest in PrEP, implementation of PrEP will focus *on those who continue to return for PrEP refills*
  - Those who don't use PrEP won't come back & will receive no benefit, but also incur no costs.
  - Those who use PrEP will achieve prevention benefits. PrEP as habit may be important for sustained use.



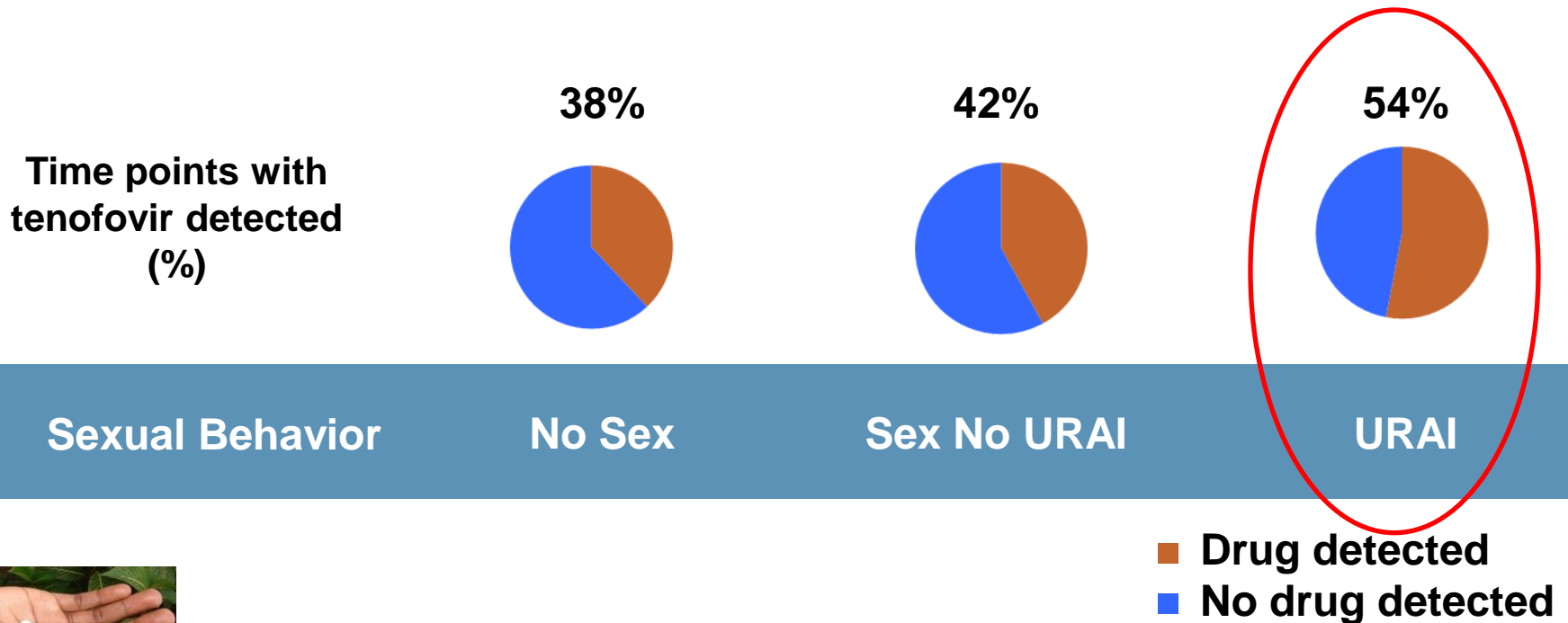
# What motivates PrEP use?

- Risk perception is a potentially powerful driver of adherence
- Partners PrEP = serodiscordant couples
  - Known HIV+ partner, ongoing exposure, decision to maintain relationship, high adherence
- FEM-PrEP = young women
  - 70% perceived themselves to be at little or no HIV risk, very low adherence
- *Understanding interface of risk perception & HIV prevention is key for any strategy*



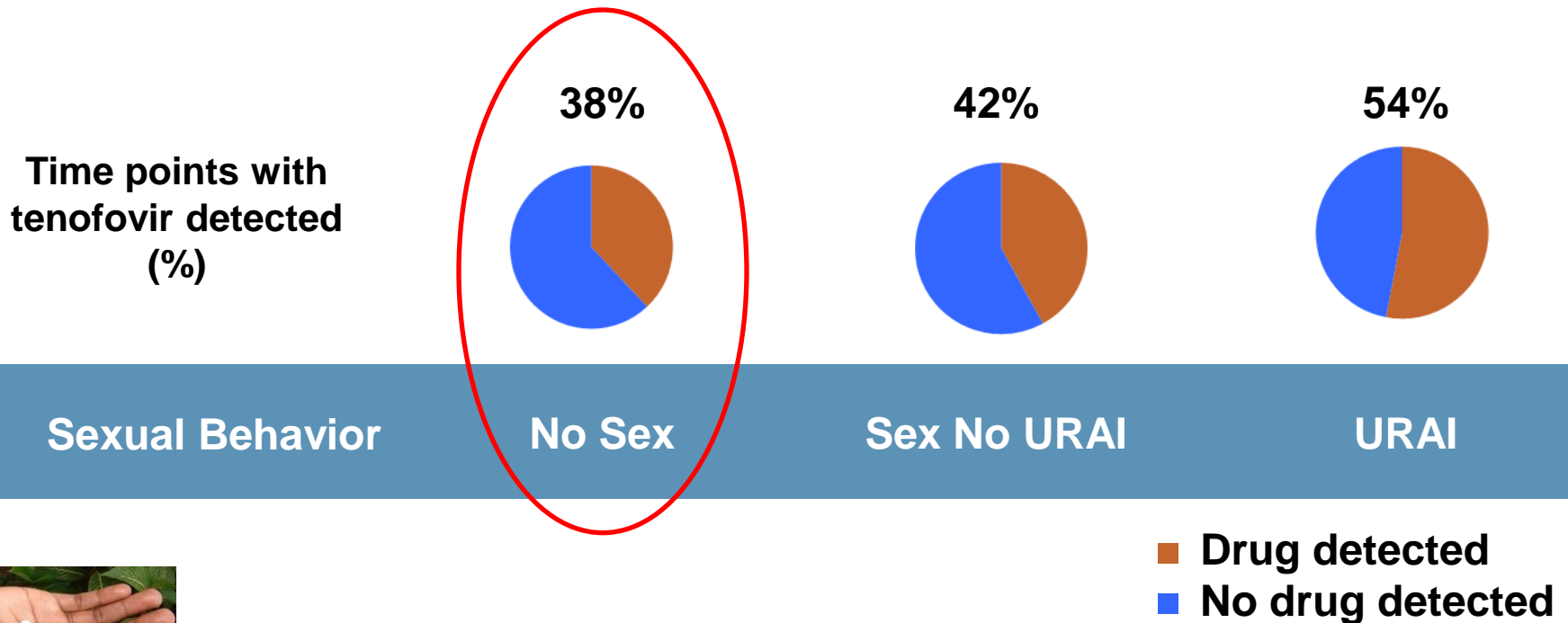
# Risk behavior and pill taking in iPrEx

- Men who practiced unprotected receptive anal intercourse had higher PrEP use than other men, and received HIV protection (subgroup efficacy = 58%)



# Risk behavior and pill taking in iPrEx

- Men who practiced unprotected receptive anal intercourse had higher PrEP use than other men, and received HIV protection (subgroup efficacy = 58%)
- Men not having sex were least likely to take PrEP





# Risk behavior and pill taking in Partners PrEP

## Multivariate predictors of low adherence by unannounced pill count

	OR	p-value
<b>Age (increase in year)</b>	<b>0.96 (0.93-1.00)</b>	<b>0.03</b>
Female	0.8 (0.5-1.5)	0.52
Socio-economic status	1.1 (0.9-1.4)	0.37
<b>Sex risk</b>		<b>0.03</b>
<b>No sex</b>	<b>4.2 (1.9-9.3)</b>	
<b>100% protected</b>	<b>reference</b>	
<b>&lt; 100% protected</b>	<b>1.7 (0.9-3.3)</b>	
<b>Sex with other partner only</b>	<b>1.4 (0.3-6.1)</b>	
<b>Sex with other + protected with index</b>	<b>2.2 (1.1-4.6)</b>	
<b>Sex with other + unprotected with index</b>	<b>3.3 (1.3-8.7)</b>	
Heavy alcohol use	2.3 (1.1-4.5)	0.10
Months on PrEP	0.98 (0.96-1.01)	0.27
<b>Age difference <math>\geq 10</math> years</b>	<b>0.3 (0.1-1.1)</b>	<b>0.02</b>



# PrEP and Behavior

## The Next Condom Conundrum

Why use a rubber when you can just pop a pill? That's what HIV-negative guys across the country are asking themselves -- and their doctors.

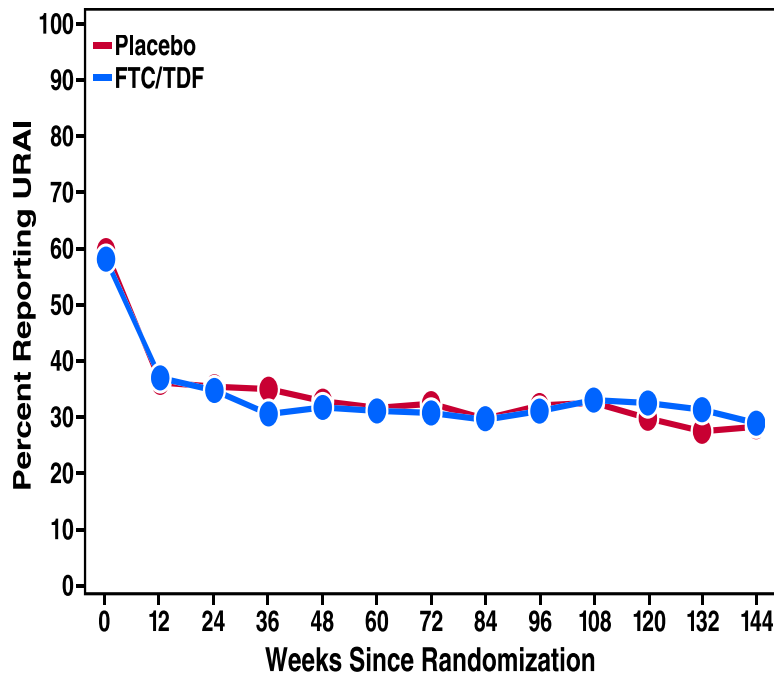
**ADVOCATE.COM**

January 2009

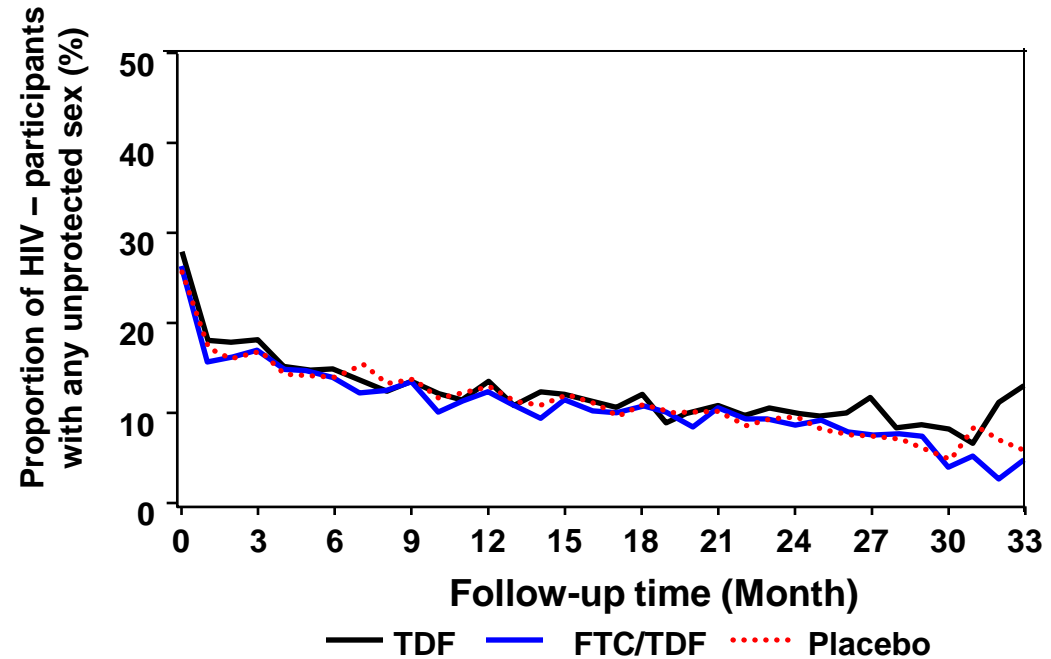


# No evidence of risk compensation in PrEP clinical trials

## iPrEx



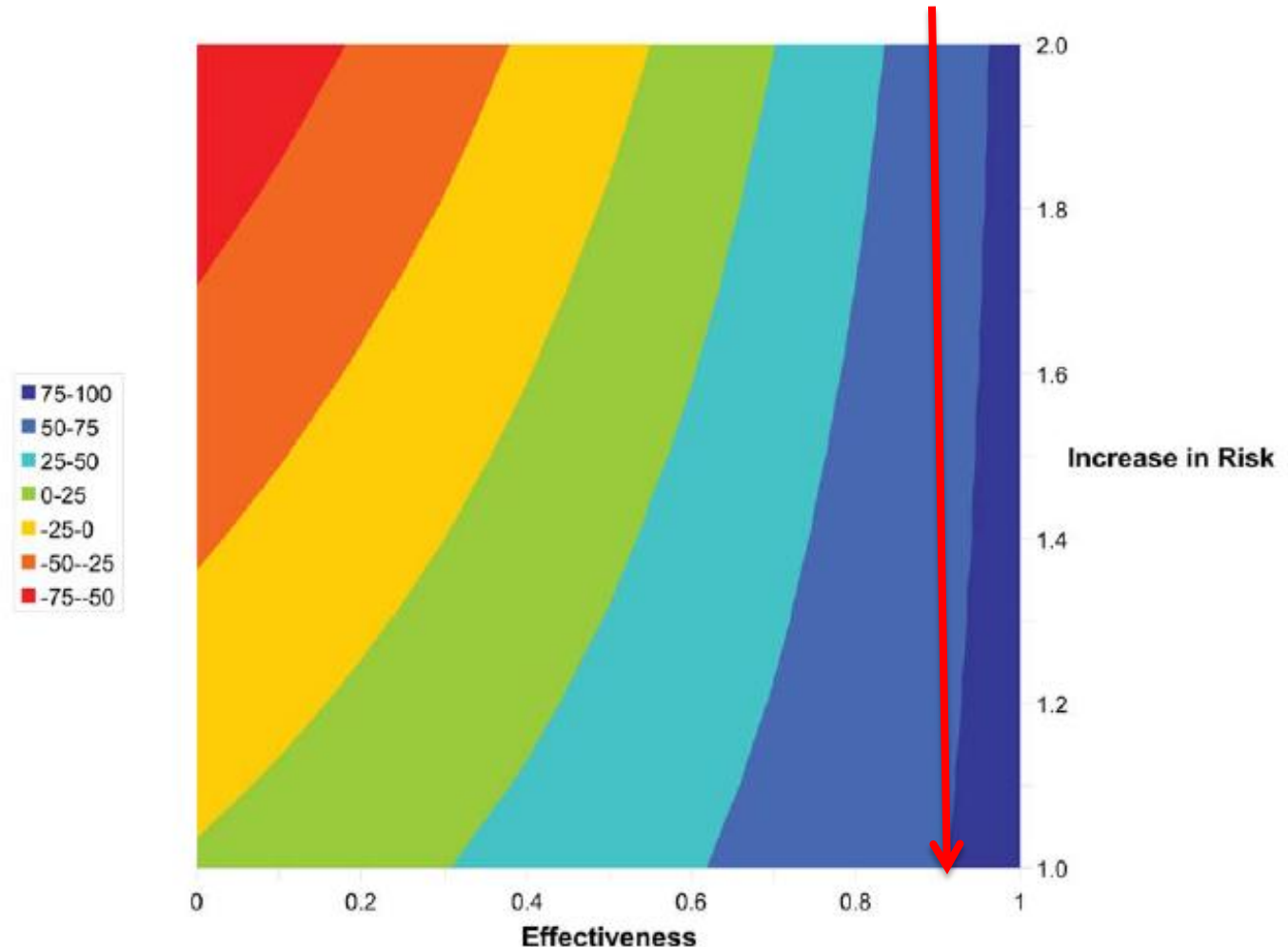
## Partners PrEP



# HIV prevention benefits in the context of potential risk compensation

Risk compensation is an important question.

However, pretty substantial increases in risk-taking would have to occur to substantially impact PrEP prevention effects.



# Adherence, adherence behavior, and risk behavior

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For ART:

What does real world adherence to antiretroviral therapy look like?

And, again, its relation to sex?



# Real-world adherence to antiretroviral treatment

- Systematic review of adherence (Mills et al JAMA 2006)
  - 28,689 patients in 228 studies

Resource-Rich Country  
54.7% (95 CI: 48.0-61.3%)

Resource-Poor Country  
77.1% (95 CI: 67.3-85.6%)



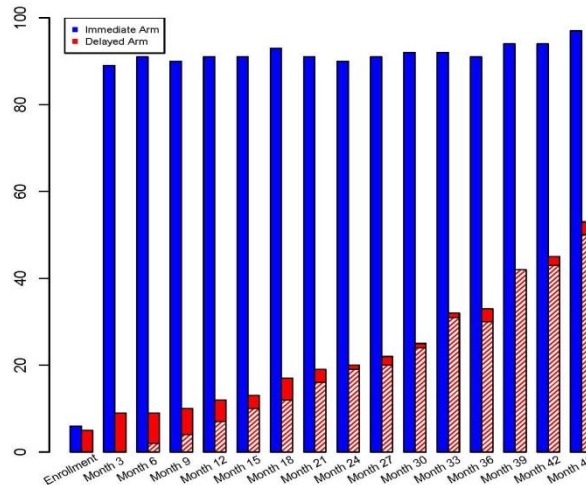
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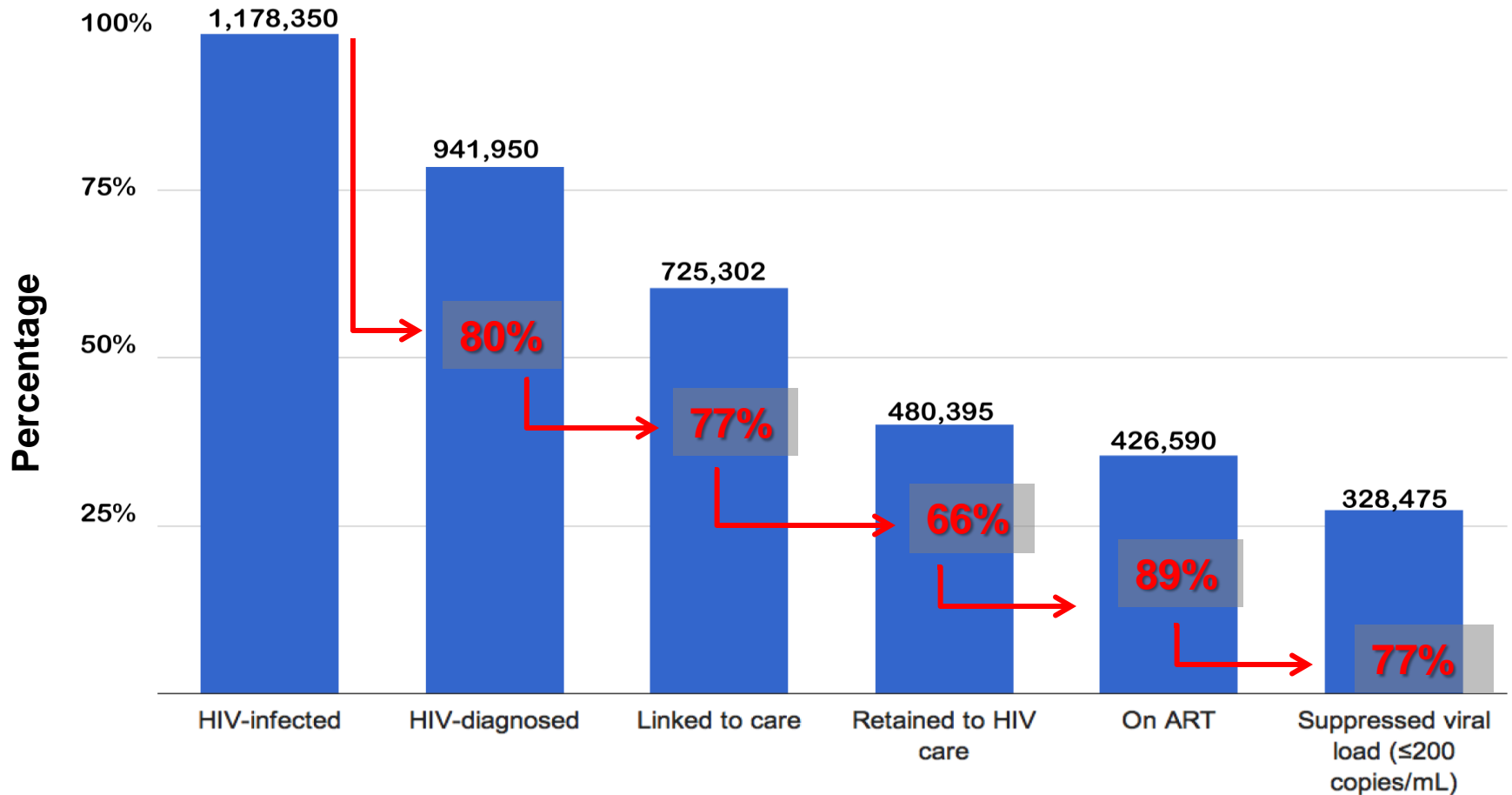
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Contrast to HPTN 052



# Treatment cascade: US



Of 1.1 million with HIV infection in the US, only 328,000 (28%) have suppressed HIV RNA

MMWR (60), 2011





# Willingness to start antiretrovirals

- Soweto, South Africa:

7287 adults tested for HIV

2562 (35%) HIV infected

743 (29%) eligible for ART (CD4<200<sup>\*\*\*</sup>)

148 (20%) refused

- Most common reason for refusal was feeling well



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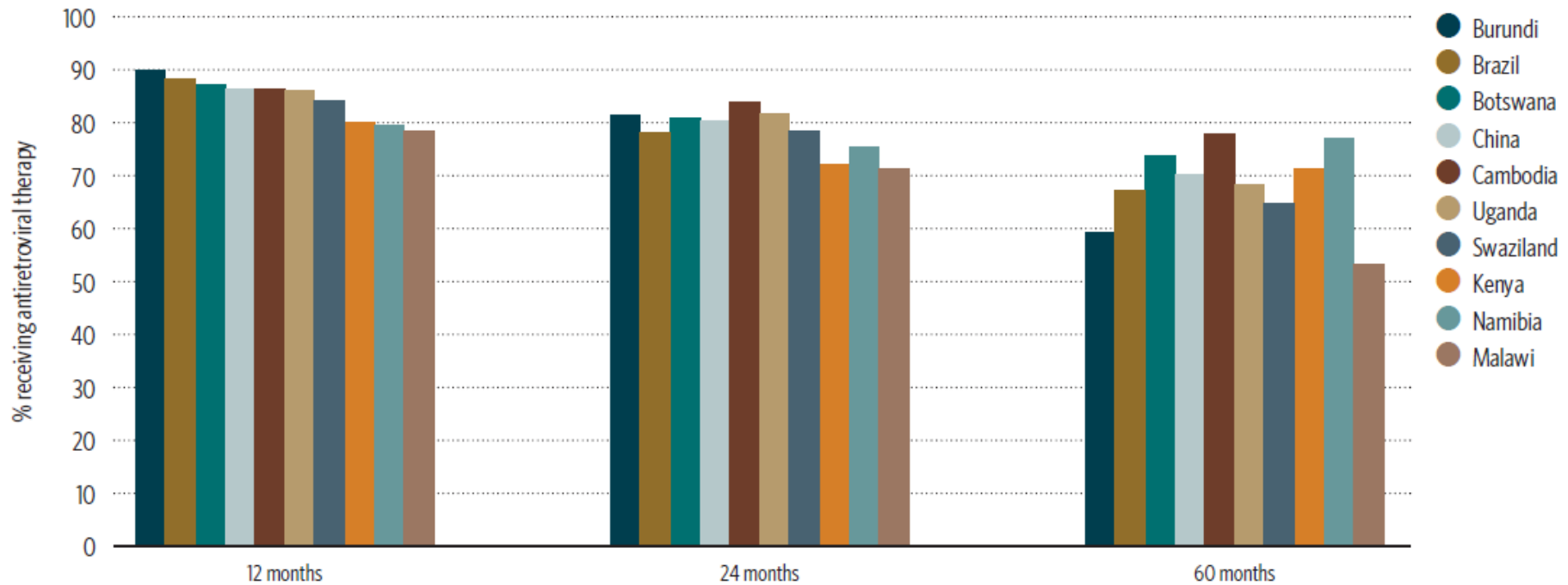
743 (29%) eligible for ART (CD4<200<sup>\*\*\*</sup>)

148 (20%) refused

- Most common reason for refusal was feeling well
- *What might this look like for those with CD4>200, >350?*



# Retention rates after starting antiretroviral therapy



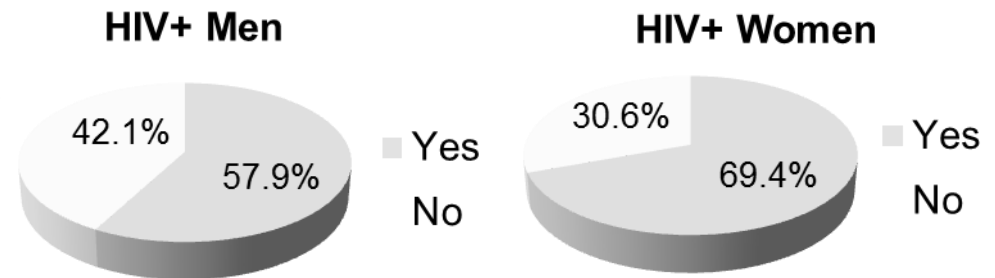
WHO, Global HIV/AIDS Response, 2011



# We have little experience with starting ART in asymptomatic persons....

- Mixed methods work in Thika, Kenya among 772 members of HIV-1 serodiscordant couples in the Partners PrEP Study

**Survey question:** Would you be willing to start antiretrovirals before your CD4 count reaches 350 if it would lower your chance of giving HIV to your partner?



## Top concerns about initiating early ART for HIV-1 prevention :

- Side effects (51.4%)
- Stigma (20.8%)
- Pill burden (19.4%)
- Potential for earlier development of antiretroviral resistance (18.1%)



# What does it mean to patients to start ART?

Focus group discussions among HIV+ members of HIV serodiscordant couples from Thika, Kenya

“Now if you start [ARVs] and you haven’t reached 350, you will feel like you have reached another stage.”

“You know the mentality that is there when you take the ARVs, it means you are at the lowest stage and that is why people fear ARVs.”

“Like me, if I am given ARVs I will think I am nearing the grave.”

Curran et al. In preparation.



# Risk behavior after starting ART

- Some data suggest that risk behaviors do not increase substantially in those starting ART (Berhan et al AIDS Res and Ther 2012)
- But little long-term data or data on those starting ART at higher CD4 counts. In several studies, pregnancy incidence increases with antiretroviral therapy.
- Incomplete genital HIV suppression with ART could mean some amount of ongoing infectious risk (Politch AIDS 2012)



# Parallel challenges, parallel opportunities

	<b>ART for HIV prevention</b>	<b>PrEP for HIV prevention</b>
<b>Adherence</b>	Necessary for efficacy	Necessary for efficacy



# Parallel challenges, parallel opportunities

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<b>Adherence</b>	Necessary for efficacy	Necessary for efficacy
<b>Sexual risk-taking</b>	Mixed evidence	Limited evidence, key theoretical concern
	<i>Principal question is whether risk-taking would be sufficient to undermine prevention benefits</i>	





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<b>Who will use?</b>	In theory, all HIV+s. Life-long.	Target to those at highest risk. Time-limited for periods of highest risk.
<b>Who will pay?</b>	Rising need = rising costs	Where fit in the priority list?



# What does this all mean for implementation?

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*Getting to work*

# ART implementation, 2004

“The potential short term gains ... may be far outweighed .... In Africa, a higher proportion of patients are likely to fall into the category of potential poor adherers unless resource intensive adherence programmes are available.”

*Pre-determining failure has not been productive in the past...*



# ART implementation, 2012

- The new challenge is the ability to scale-up ART sufficiently to have an impact on the epidemic:
  - Testing → linkage to care → ART initiation → sustained use
  - Most HIV-infected persons currently have high CD4 counts and lack of clinical disease
  - Large community-randomized trials to gauge impact of HIV testing and earlier ART implementation to be done (HPTN 071, Botswana, Africa Centre, Irgina)
    - ***But we need not wait for these to work on figuring out how to deliver ART better***



# ART implementation, 2012

- Innovative, envelope-pushing implementation is already underway. These make sense to do & evaluate.

- US DHHS guidelines evolving to higher CD4 counts, in parallel with knowledge of clinical benefits, prevention benefits, medication tolerability

• Antiretroviral therapy (ART) is recommended for all HIV-infected individuals. The strength of this recommendation varies on the basis of pretreatment CD4 cell count:

- CD4 count <350 cells/mm<sup>3</sup> (AI)
- CD4 count 350 to 500 cells/mm<sup>3</sup> (AII)
- CD4 count >500 cells/mm<sup>3</sup> (BIII)

- San Francisco and New York public health departments recommending universal treatment

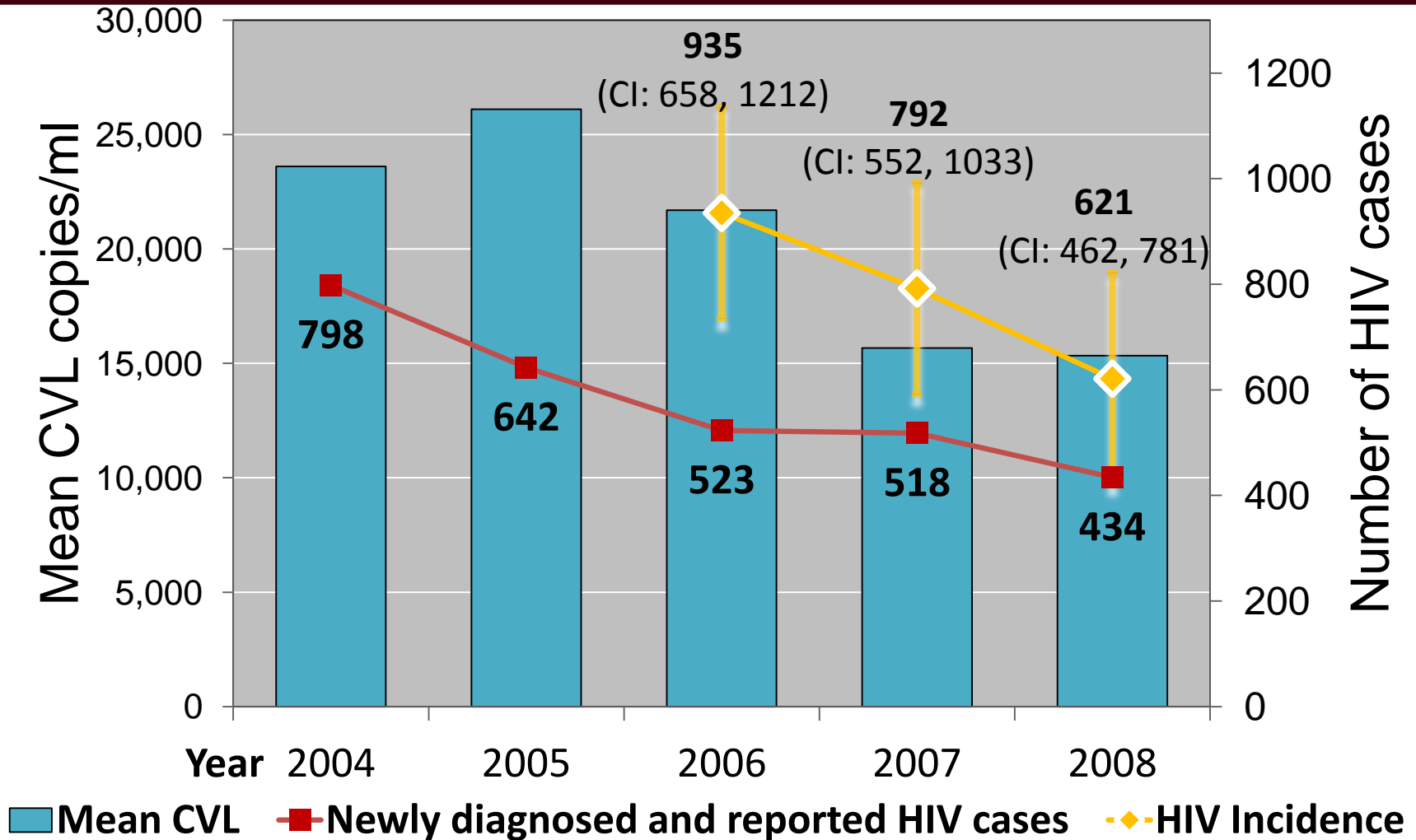
**SF Endorses New Policy for Treatment of H.I.V.- 'start HAART as soon as found to be infected'**

NY Times  
By SABIN RUSSELL  
Published: April 2, 2010

- Countries making policies to increase earlier access to ART: WHO Option B+ for pregnant women (Malawi), immediate initiation for HIV serodiscordant couples (Rwanda)



# Ecological evidence: San Francisco



Das et al. PLoS One 2010





# Scaling up antiretroviral therapy for HIV prevention

- The greatest treatment (and prevention) impact is with delivery of ART to those with lower CD4 counts – and scale-up is not sufficient yet for this group

	Prior to ART initiation		
	Transmissions	Person-Years	Rate
CD4 < 200	8	91	8.8
CD4 200-350	41	1467	2.8
CD4 350-500	24	1408	1.7
CD4 ≥ 500	29	1592	1.8

Donnell et al. Lancet 2010



# PrEP implementation, 2012

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- Unlike ART, the research questions here are brand-new
- Multiple open-label projects, in and outside of the US, are planned, for oral PrEP
- Primary goals: can PrEP be done?



# PrEP demonstration questions, 2012

<b>Topic</b>	<b>Question</b>
<b>Targeting</b>	Who to prioritize for PrEP?
<b>Uptake</b>	Do those who might benefit most from PrEP want it?
<b>Adherence</b>	Who takes PrEP? Do they take it often enough?
<b>Sexual behavior</b>	PrEP use as relates to behavior?
<b>Impact</b>	HIV incidence? Resistance? Costs?



# FDA review of PrEP for HIV prevention

- The US FDA is currently reviewing a label indication for emtricitabine/tenofovir (Truvada®) for HIV prevention. On 10 May 2012 an Advisory Committee to the FDA recommended that the label indication be added.
- If approved (FDA decision expected in June), would be the first medication indication for prevention of sexual transmission of HIV.

AIDS RESEARCH

## FDA Panel Recommends Anti-HIV Drug for Prevention

Science Magazine May 2012



# Next-generation PrEP research



**Pill**



**Gel**



**Vaginal film**



**Vaginal ring**



**Injectable**



# Changing the conversation



## DIARRHEA


It might seem like diarrhea is no biggie. That's probably 'cause you never had it like I have. Try shitting your guts out every day for weeks at a time. How about being terrified to go anywhere because you might crap your pants?

Don't get me wrong, I'm really glad to be alive, but

**HIV IS NO PICNIC**

I don't care how good the sex is or how hot the guy is, nothing is worth what I'm going through now.

stopaids.org

 **STOP**  
PROJECT

Design: Better World Advertising (www.betterworldadvertising.com)

How do we talk about the benefits for treatment and PrEP?

(after years of telling people not to get HIV because antiretrovirals are awful)



# Changing the conversation

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- **Antiretroviral therapy**
  - Treatment is health-preserving and not reflecting late-stage sickness
- **PrEP**
  - PrEP is not life-long – targeted months/years of PrEP might avoid 40+ years of treatment



# Guidance will come – for ART, for PrEP, for both as they relate to each other

Centers for Disease Control and Prevention

**MMWR**

Morbidity and Mortality Weekly Report

Weekly / Vol. 60 / No. 3

January 28, 2011

## Interim Guidance: Preexposure Prophylaxis for the Prevention of HIV Infection in Men Who Have Sex with Men

GUIDANCE ON  
COUPLES HIV TESTING AND COUNSELLING  
INCLUDING ANTIRETROVIRAL THERAPY FOR TREATMENT  
AND PREVENTION IN SERODISCORDANT COUPLES

Recommendations for a public health approach

APRIL 2012



 World Health  
Organization

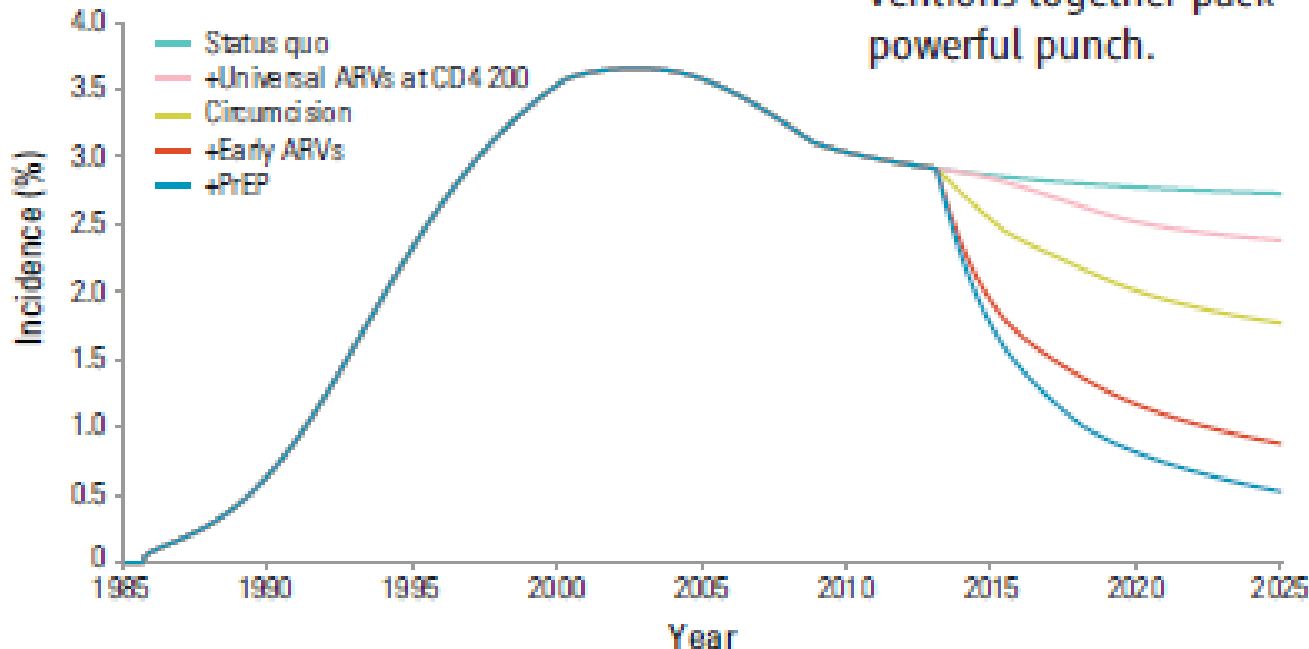




# It is not ART vs. PrEP, or ART or PrEP – greatest impact with implementing effective strategies together

## COMBO PREVENTION MODEL

In sum. Different interventions together pack powerful punch.



From Cohen Science 2011, model from Cremin and Hallett



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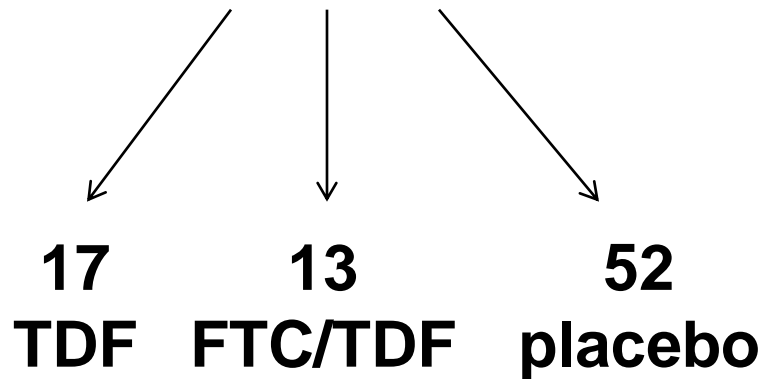
Our thoughts for next steps in couples

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# Partners PrEP: PrEP among heterosexual men and women

- ✓ **4758 couples**, in which HIV+ partner not yet eligible for ART, randomized 1:1:1 to daily oral TDF or FTC/TDF vs placebo

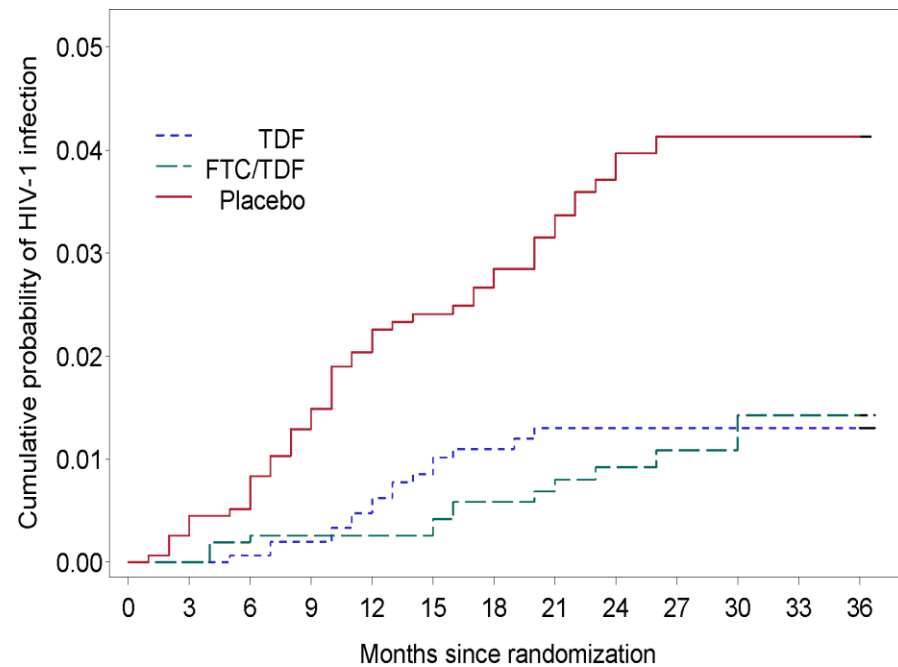
**82 HIV infections**



**Reduction in HIV acquisition:**

**TDF = 67%** (95% CI 44%-81%)

**FTC/TDF = 75%** (95% CI 55%-87%)



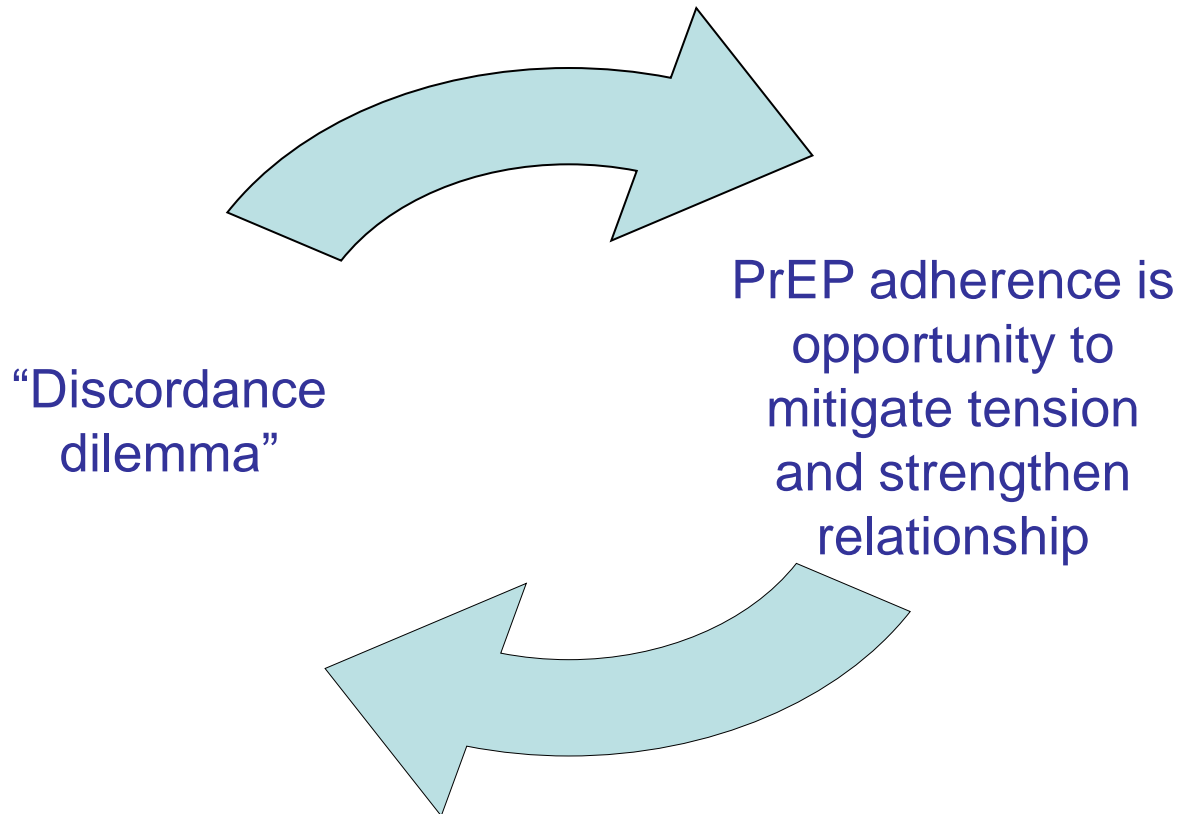
# Rationale for evaluation of PrEP in heterosexual HIV-1 serodiscordant couples

- Public health relevance
  - In Africa and worldwide, a substantial proportion of new HIV-1 cases occur in coupled relationships.
  - Serodiscordant couples are common: half of partners of HIV-1 infected persons are HIV-1 uninfected
  - PrEP is a strategy under the control of an HIV-1 uninfected person



# High adherence to PrEP in HIV serodiscordant couples

## PrEP Resolves Tension in a Committed HIV Discordant Sexual Relationship



# PrEP and HIV-1 serodiscordant couples

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- Both PrEP and ART have been demonstrated to provide substantial protection against HIV infection
  - ART is clearly the priority for HIV+ partners with lower CD4 counts
  - Not all HIV+ partners will start ART, or can/will start immediately
  - PrEP could be used as a time-limited “bridge” to ART start



# HPTN 052: HIV transmissions

Total HIV-1 Transmission Events: 39

Linked  
Transmissions: 28

Unlinked or TBD  
Transmissions: 11

Immediate  
Arm: 1

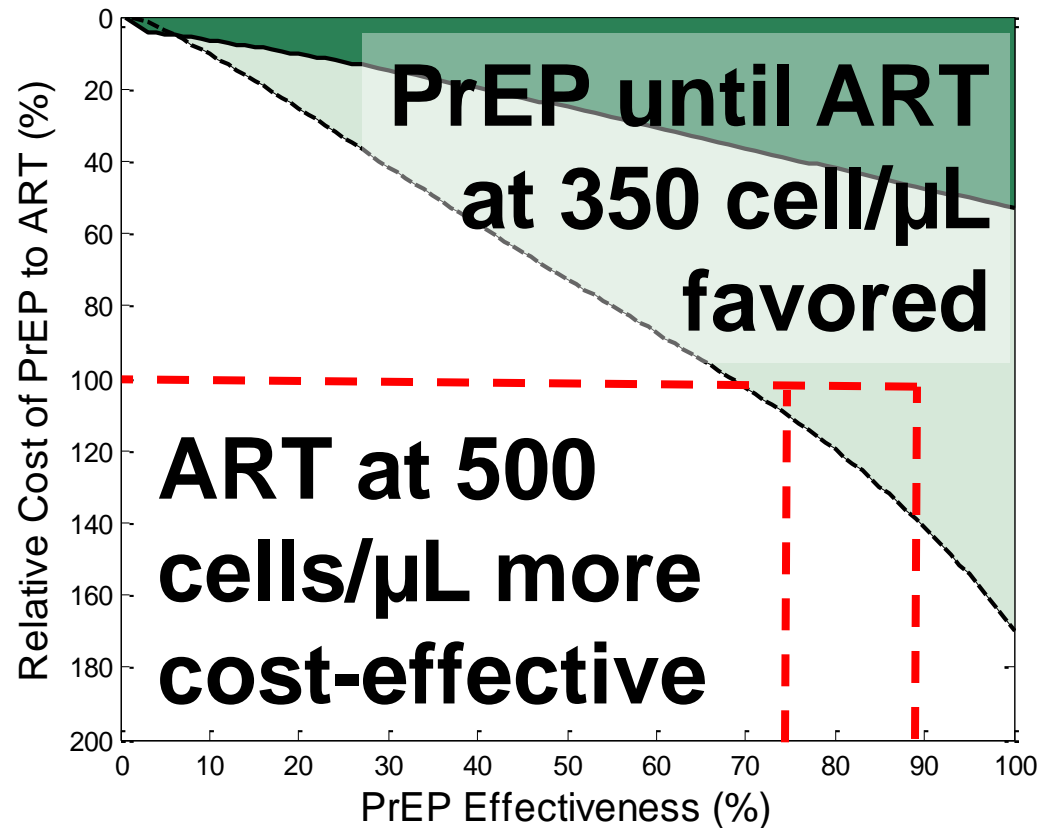
Delayed  
Arm: 27

$p < 0.001$

Notably, 25-30% of new infections in couples occur from outside partnerships (Campbell et al PLoS One 2011; Hughes et al. J Infect Dis 2011)

# PrEP and HIV-1 serodiscordant couples

- Staged use of PrEP, as a bridge to ART, could be an effective and cost-effective public health strategy



Hallett et al. *PLoS Med* 2011



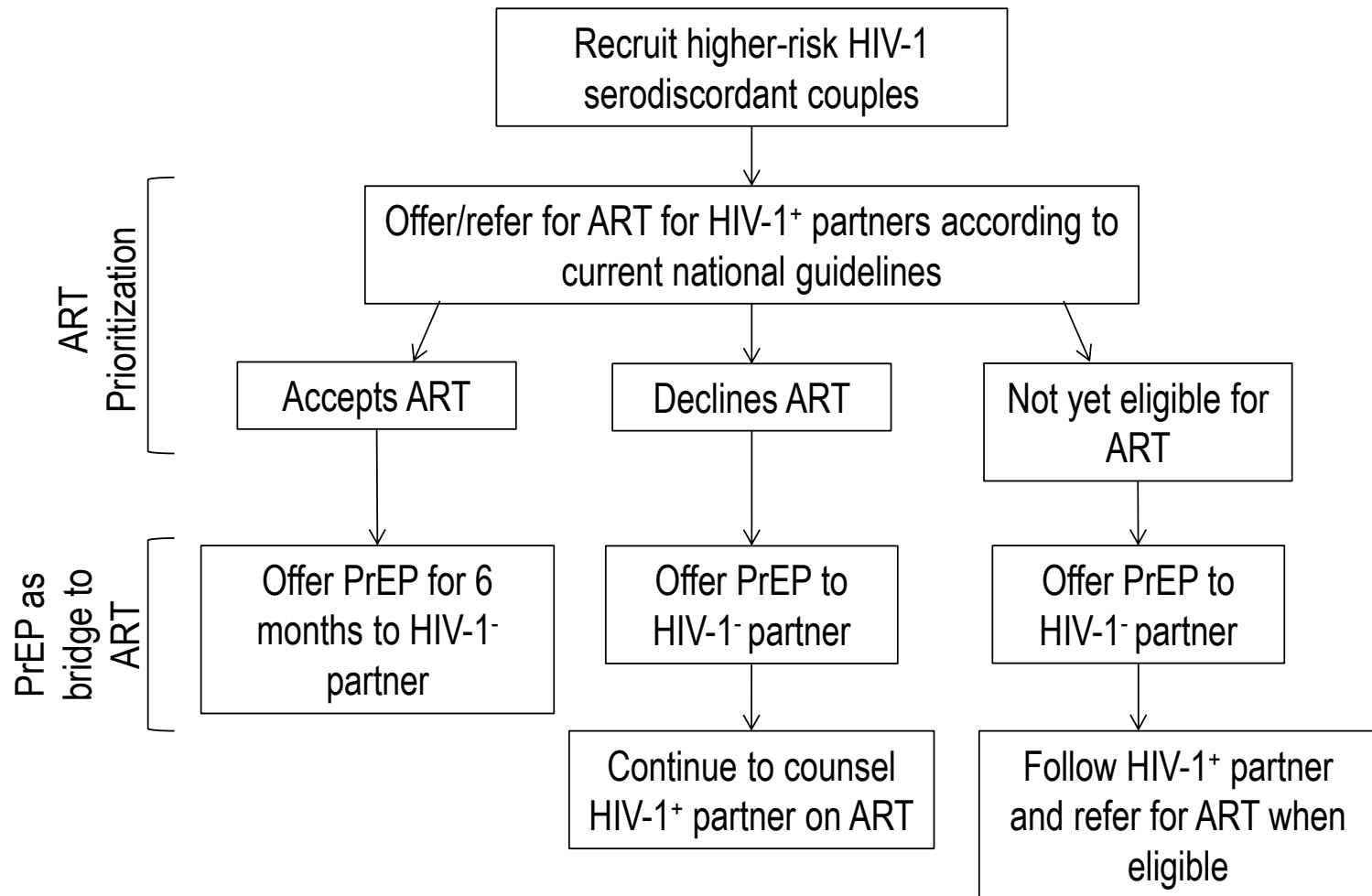


# Demonstration project work for PrEP and antiretrovirals for HIV-1 prevention

- Subset of Partners PrEP Study sites in Kenya and Uganda
- Open-label demonstration project among new, high-risk HIV-1 serodiscordant couples
- Assess interest in, uptake of, and adherence to FTC/TDF PrEP & ART (provided according to national guidelines)
  - PrEP as bridge to ART initiation
- Timeline: mid-2012 to 2015



# Demonstration project approach – PrEP as bridge to ART in couples



Timeline: 2012 to 2015

Funding: NIMH/NIH, Bill & Melinda Gates Foundation



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# Conclusions

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# Summary

- The **science** is clear: clinical trials provide clear and definitive evidence that antiretroviral treatment and PrEP work for the prevention of sexual transmission of HIV.
- Translating science into **practice** is the priority. PrEP and ART face parallel challenges – including adherence, risk behavior, costs.



# Next steps

## ART:

- Can we deliver more ART and deliver it better?
- Can we show, through large-scale research and operations, the big impact we expect?
- Will people take it? Especially at higher CD4

## PrEP:

- Can we figure out how to deliver this promising strategy in real-world settings?
- Will people take it? For how long? How can motivation be increased?

## ART & PrEP together:

- Can we maximize the benefits of these complimentary and revolutionary interventions?



# Bringing it all together: ART + PrEP, as part of combination prevention

- Now is the time to implement what works for HIV prevention. We are at a rare moment – we have a powerful package of interventions for HIV prevention that have the potential to change the direction of the epidemic.



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- Now is the time to implement what works for HIV prevention. We are at a rare moment – we have a powerful package of interventions for HIV prevention that have the potential to change the direction of the epidemic.



*This is transformative:  
Let's Rock and Roll*



# Thank you

- **Partners PrEP Study team**
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