

# **HIV Pre-Exposure Prophylaxis**

## **„PREP“**

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**Kantonsspital St. Gallen**  
**Switzerland**

# Acknowledgment

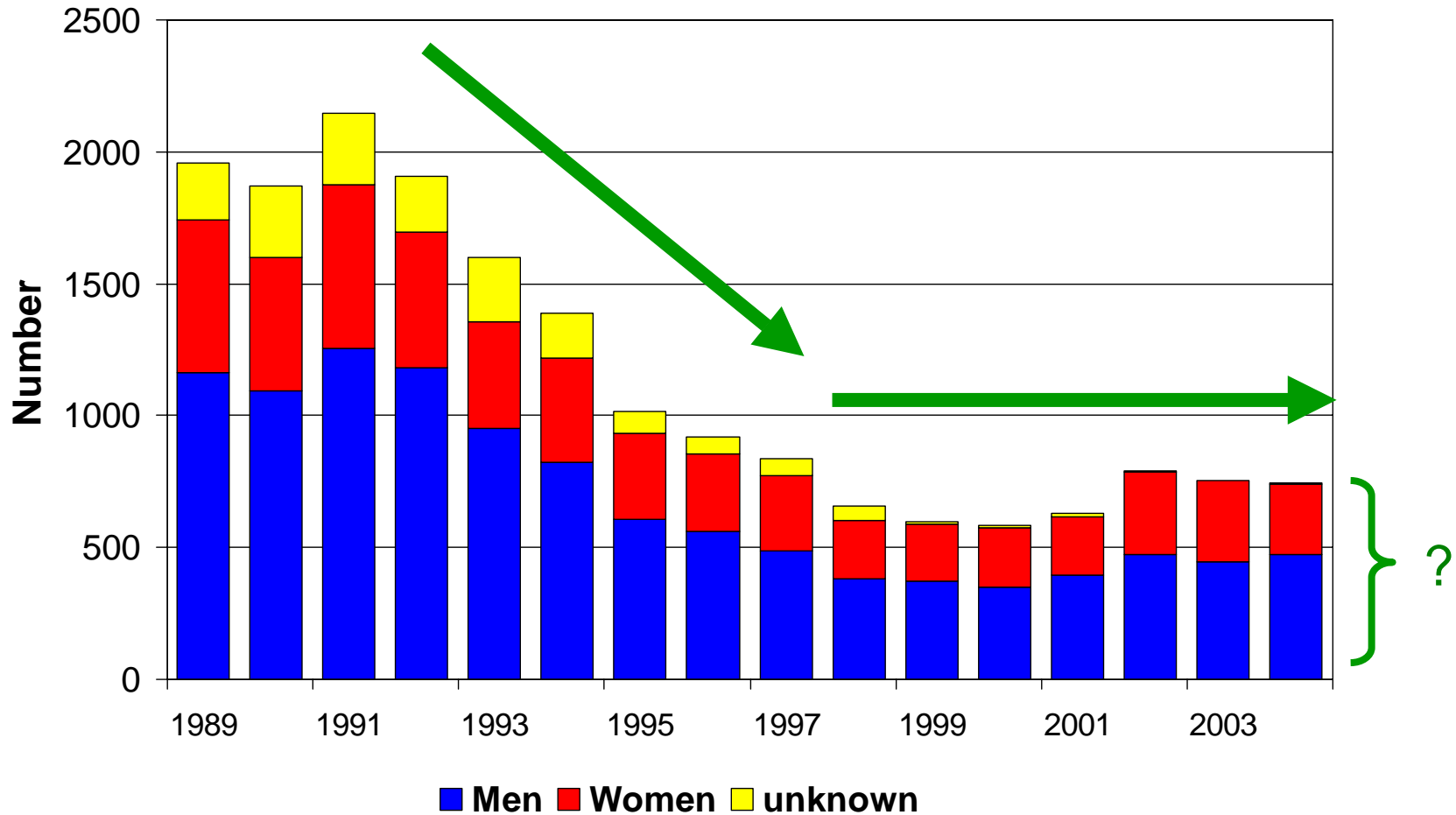
**Robert M Grant, MD, MPH**

**Gladstone Institute of Virology and  
Immunology, UCSF**

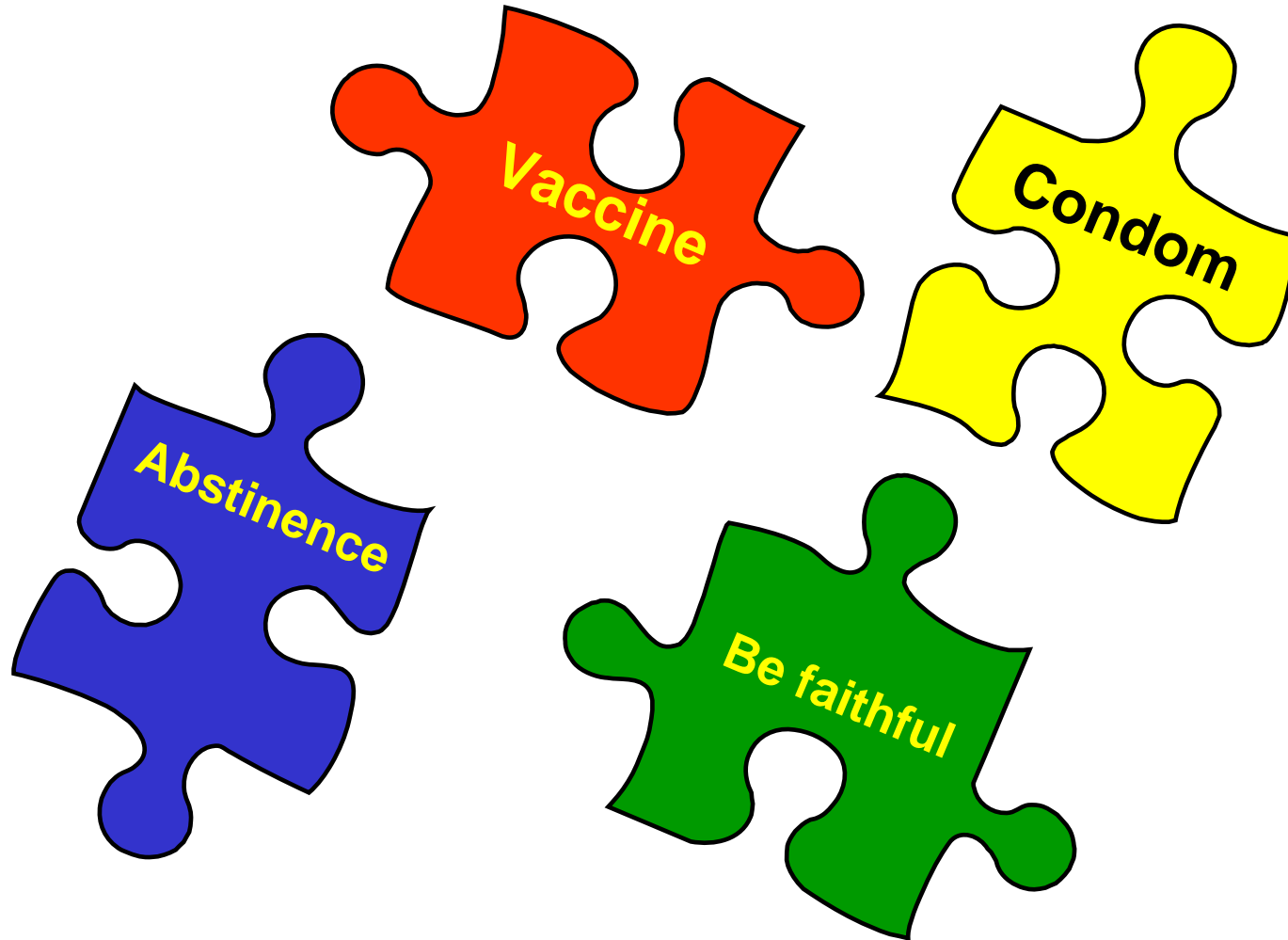


**ID-Team, St. Gallen, Switzerland**

# HIV-Reports, Switzerland



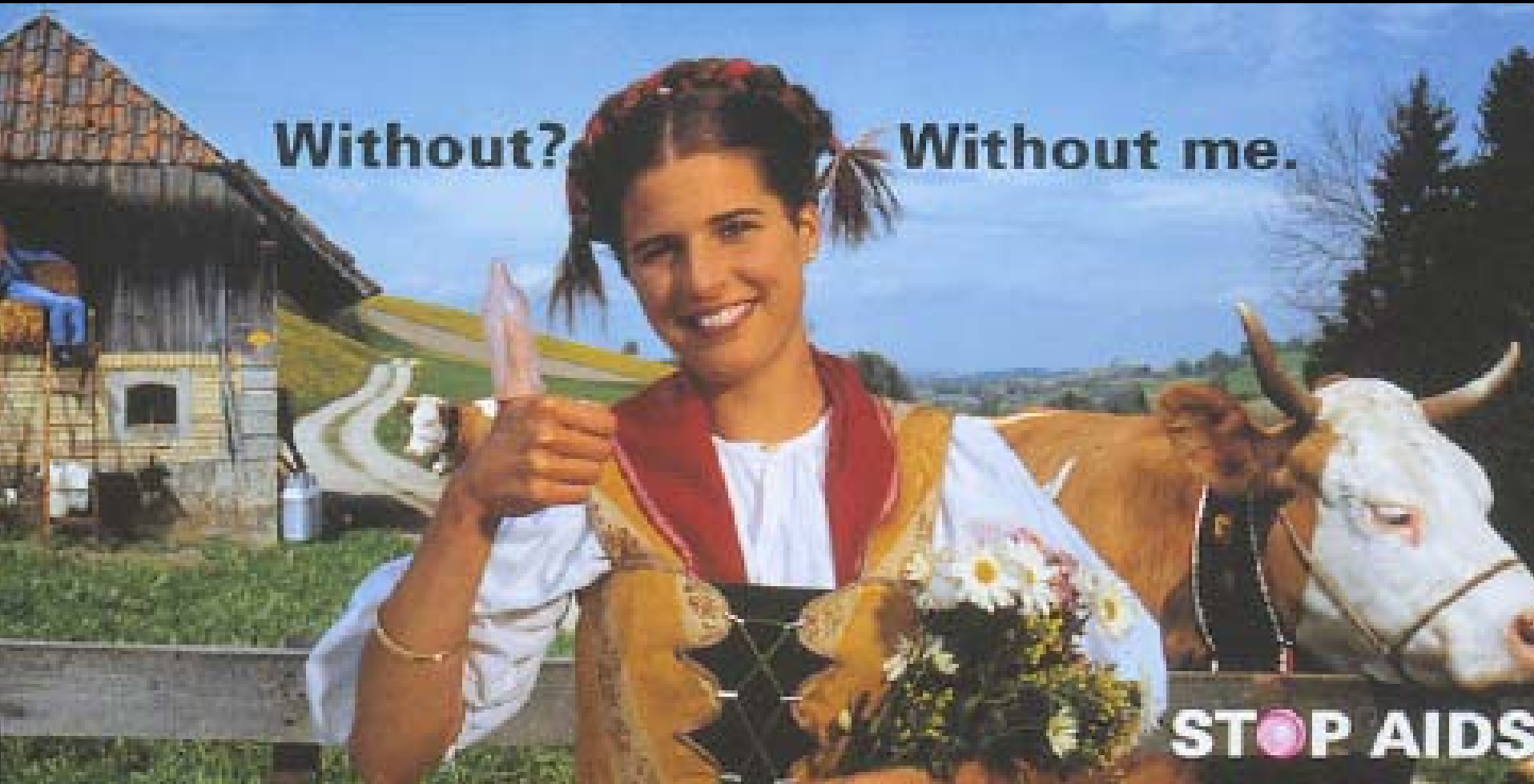
# ABC of Prevention: a multifaceted task



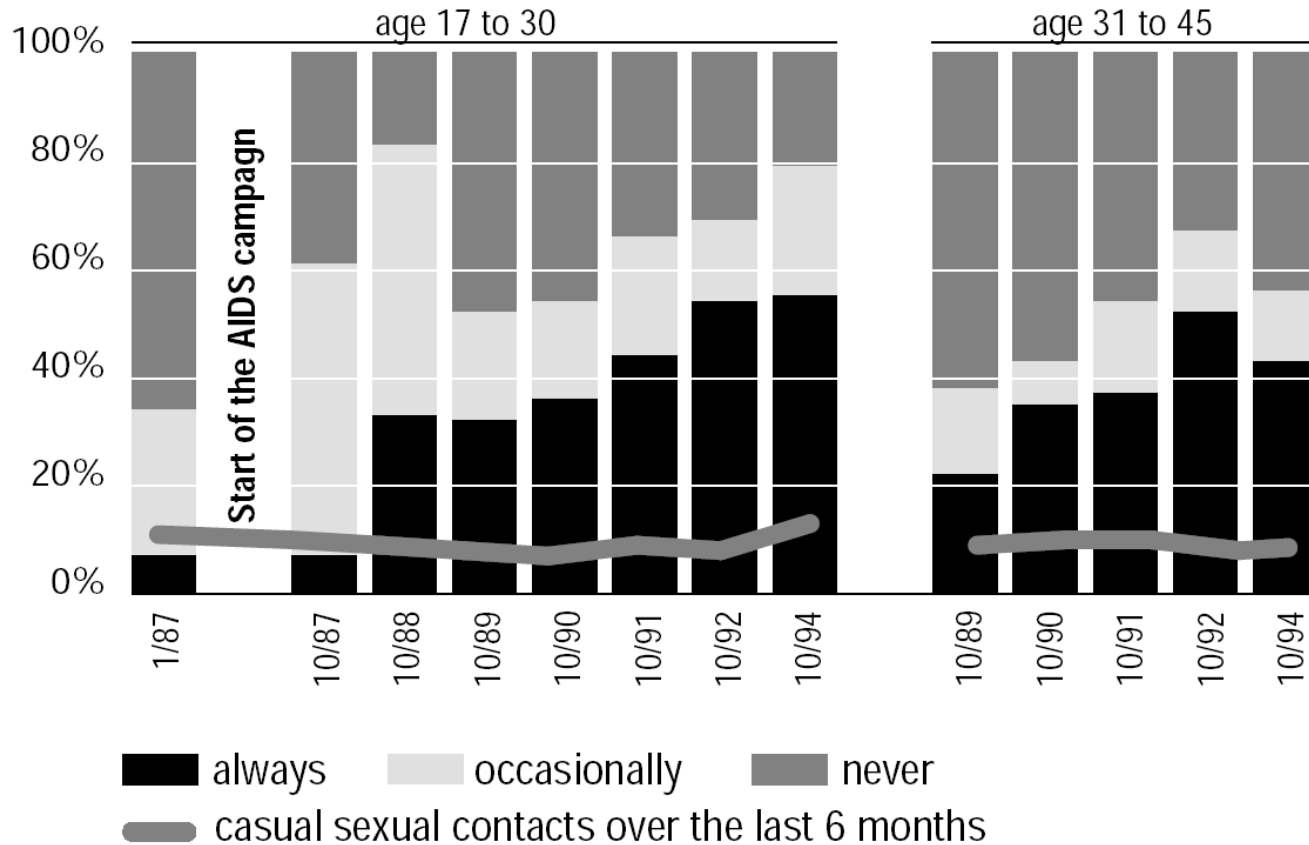
**Without?**

**Without me.**

**STOP AIDS**



# Condom use in Switzerland



# Limitations of Condoms

- **If used correctly → Best prevention**
- **Limitations include**
  - **lack of availability of condoms**
  - **incorrect use leading to breakage**
  - **incomplete use**
  - **failure to use condom at all**
- **Difference in sexual pleasure and intimacy**

# Can drugs improve prevention ?

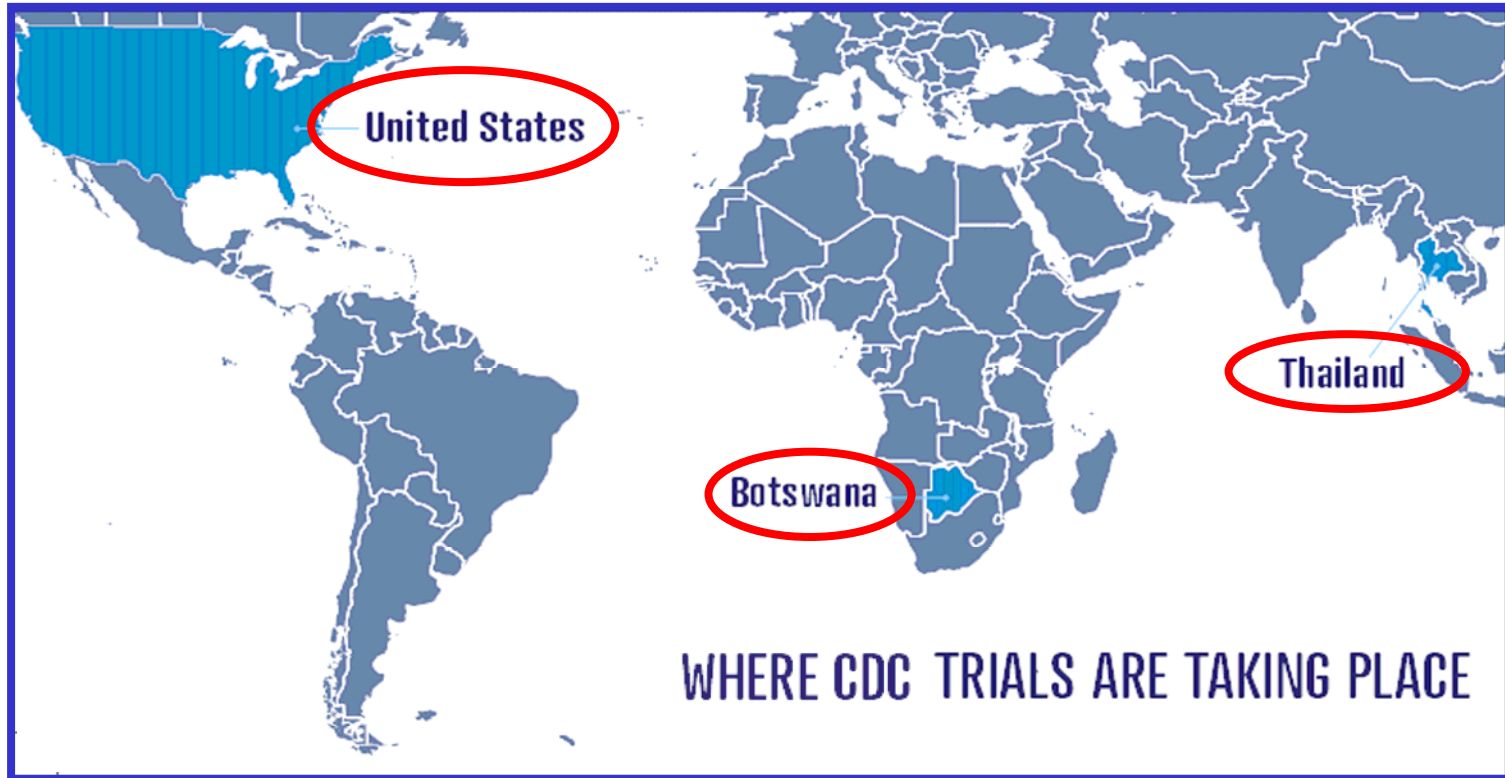
- **Drugs work in PEP:**
  - despite lack of RCT-data
  - PEP availability often limited (too late)
  - PEP fails if not initiated (Schechter et al, 9<sup>th</sup> CROI, 2001)
  - No association with behavioral disinhibition  
(Roland *et al.* *JID*)
- **Drugs prevent vertical transmission**
- **Drugs used to prevent other medical conditions**
  - INH-Prophylaxis, Meningococcal-Meningitis, Influenza-Prevention
  - Statins for CHD
  - Vitamins
- **STDs: Only drugs made a significant change**



# Pre-exposure prophylaxis

- **Advantages:**
    - Can be female initiated
    - Use w/o knowledge of partner possible
    - No interruption of sexual practice
  - **Disadvantages**
    - Efficacy unknown
    - Effect on risk behaviour unknown
- } to be evaluated

# Trials are ongoing.....



# Ideal Chemoprophylactic Agent

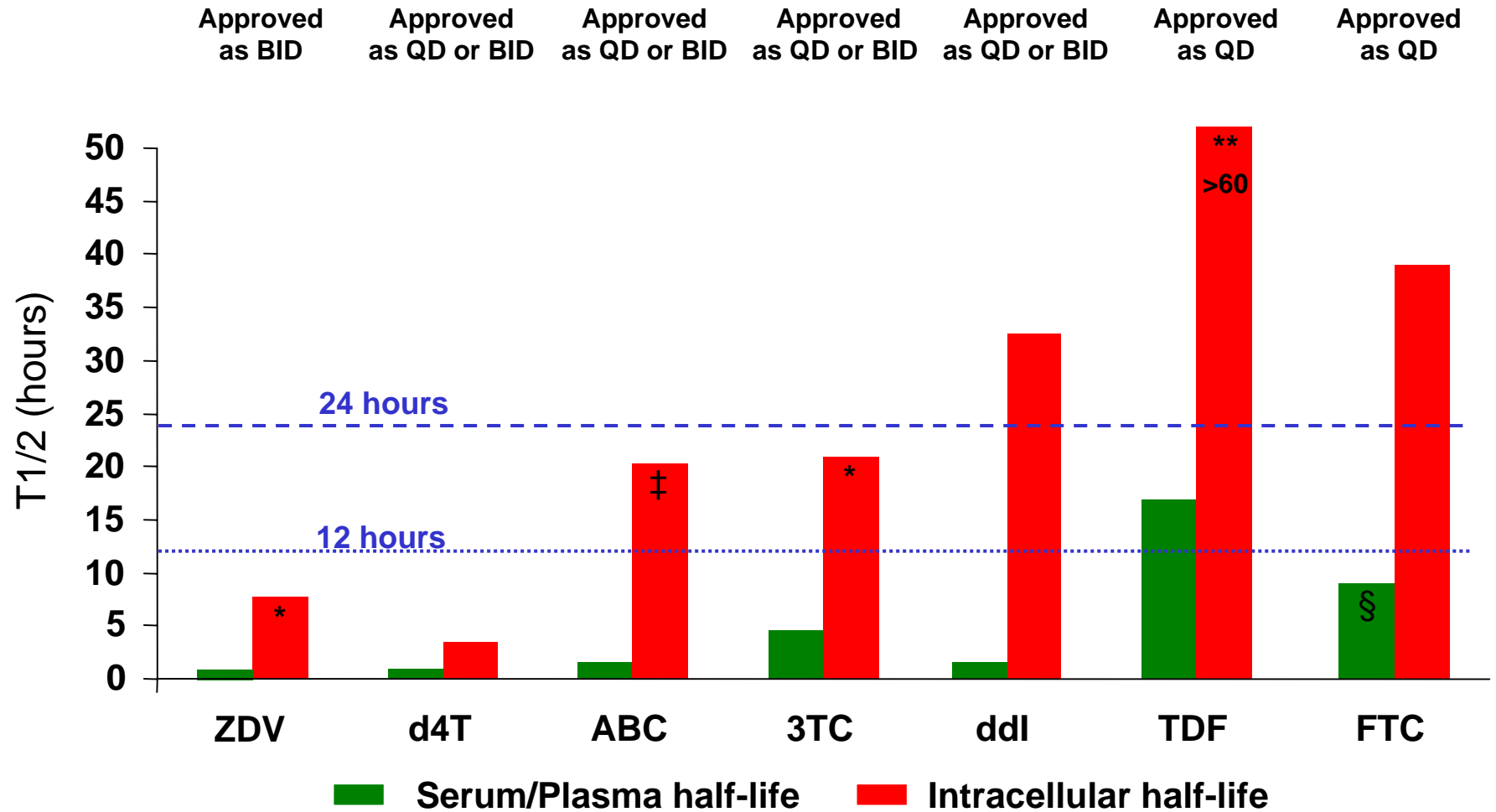
- **Long half life**
- **Low toxicity**
- **High tolerability**
- **High barrier to resistance**
- **Inexpensive to produce**
- **Stable in heat and humidity**
- **No food requirements**

# Tenofovir Disoproxil Fumarate

- **qd, no food requirement**
- **Evaluated in >15,000 study subj.**
- **Used in > 200,000 people for HIV**
- **Limited experience in HIV-neg.**
- **Generally safe, effective, and well-tolerated**

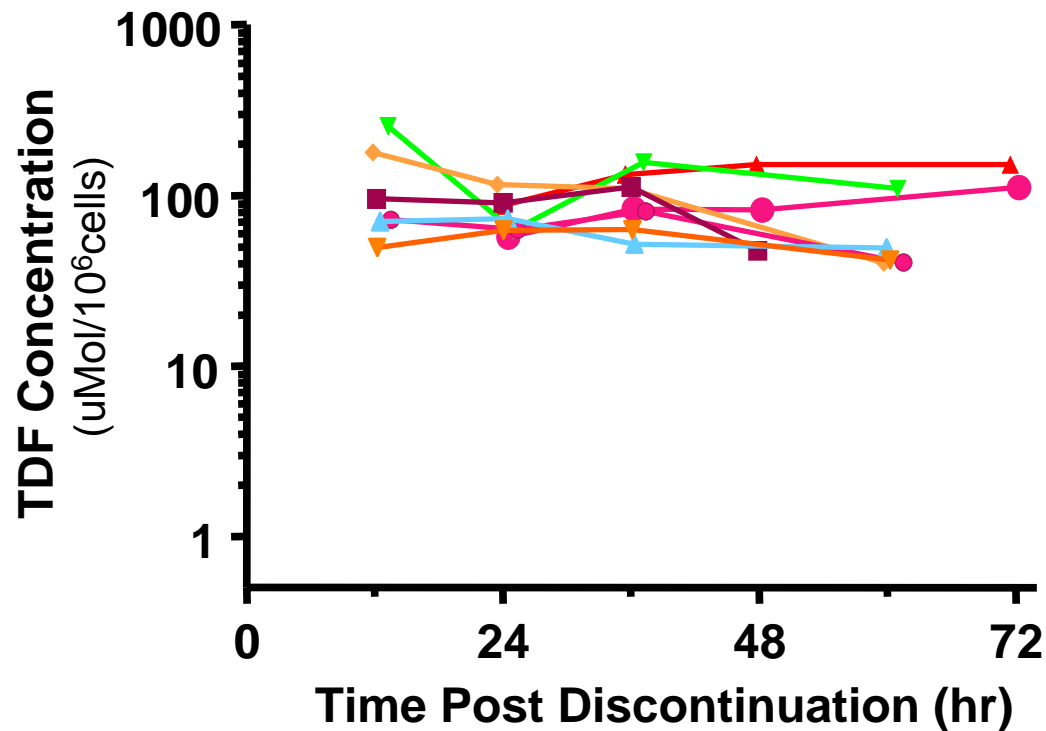


# Tenofovir lasts a long time in the body especially inside cells, where it acts



†Data from Centers for Disease Control and Prevention. *MMWR Recomm Rep.* 2002;51(RR-7):1-64 unless otherwise noted  
 \*Anderson et al. *AIDS* 2003; 17(15):2159-2168. ‡Pillero et al. 43rd ICAAC, Chicago, 2003.  
 \*\* Hawkins et al. 5th IWCPHT, Rome, 2004 § Wang et al. IAC, 2002, poster #4546.

# Intracellular TDF after Discontinuation



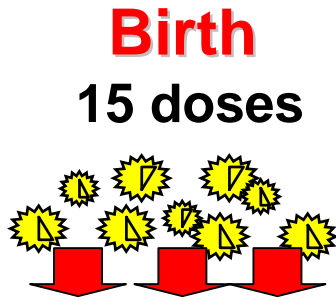
Intracellular  
TDF -  $T_{1/2}$   
>60 hours

Hawkins, T. *XV Int AIDS Conf*, July 2004, Bangkok, #4627

**TDF protects infant macaques  
against infection following repeated low-  
dose oral exposure to virulent SIV.**

# Controls

N=26

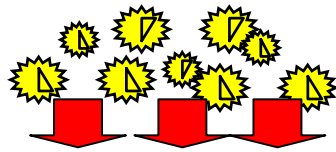


cumulative

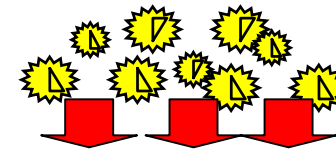
24/26 pos

# Tenofovir

N=6



Tenofovir DF 7d



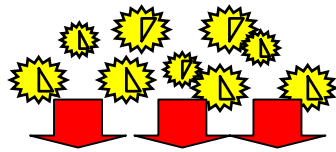
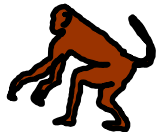
Tenofovir DF 7d

3 / 6 +

**P=0.006**

6/12 pos

N=6



Tenofovir DF 10 mg/kg for 7 weeks

3 / 6 +



# Trsm of TDF-resistant HIV ?

## In theory:

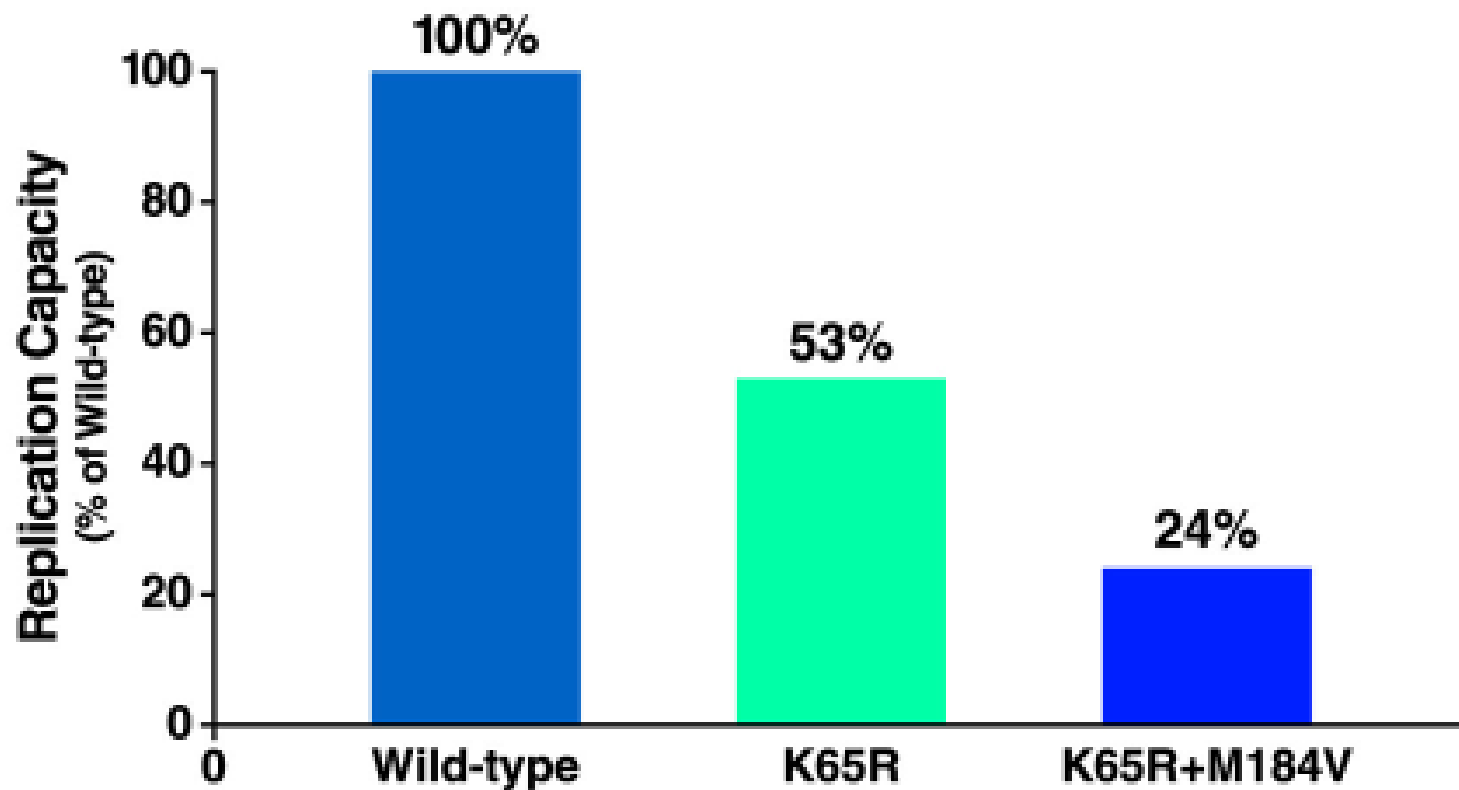
- **TDF-PREP selects for resistant HIV**
- **Resistant HIV → less „fit“**
- **⇓ fitness → ⇓ Transmission risk**

Antiviral Therapy 9:375-384

## Infrequent transmission of HIV-1 drug-resistant variants

*Sabine Yerly<sup>1</sup>, Stéphanie Jost<sup>1</sup>, Amalio Telenti<sup>2</sup>, Markus Flepp<sup>3</sup>, Laurent Kaiser<sup>1</sup>, Jean-Philippe Chave<sup>4</sup>, Pietro Vernazza<sup>5</sup>, Manuel Battegay<sup>6</sup>, Hansjakob Furrer<sup>7</sup>, Bruno Chanzy<sup>8</sup>, Philippe Burgisser<sup>2</sup>, Martin Rickenbach<sup>9</sup>, Martin Gebhardt<sup>10</sup>, Marie-Charlotte Bernard<sup>1</sup>, Thomas Perneger<sup>11</sup>, Bernard Hirschel<sup>1</sup>, Luc Perrin<sup>1\*</sup> and the Swiss HIV Cohort Study (SHCS)*

# Low viral replication capacity for K65R TDF-resistant HIV-1

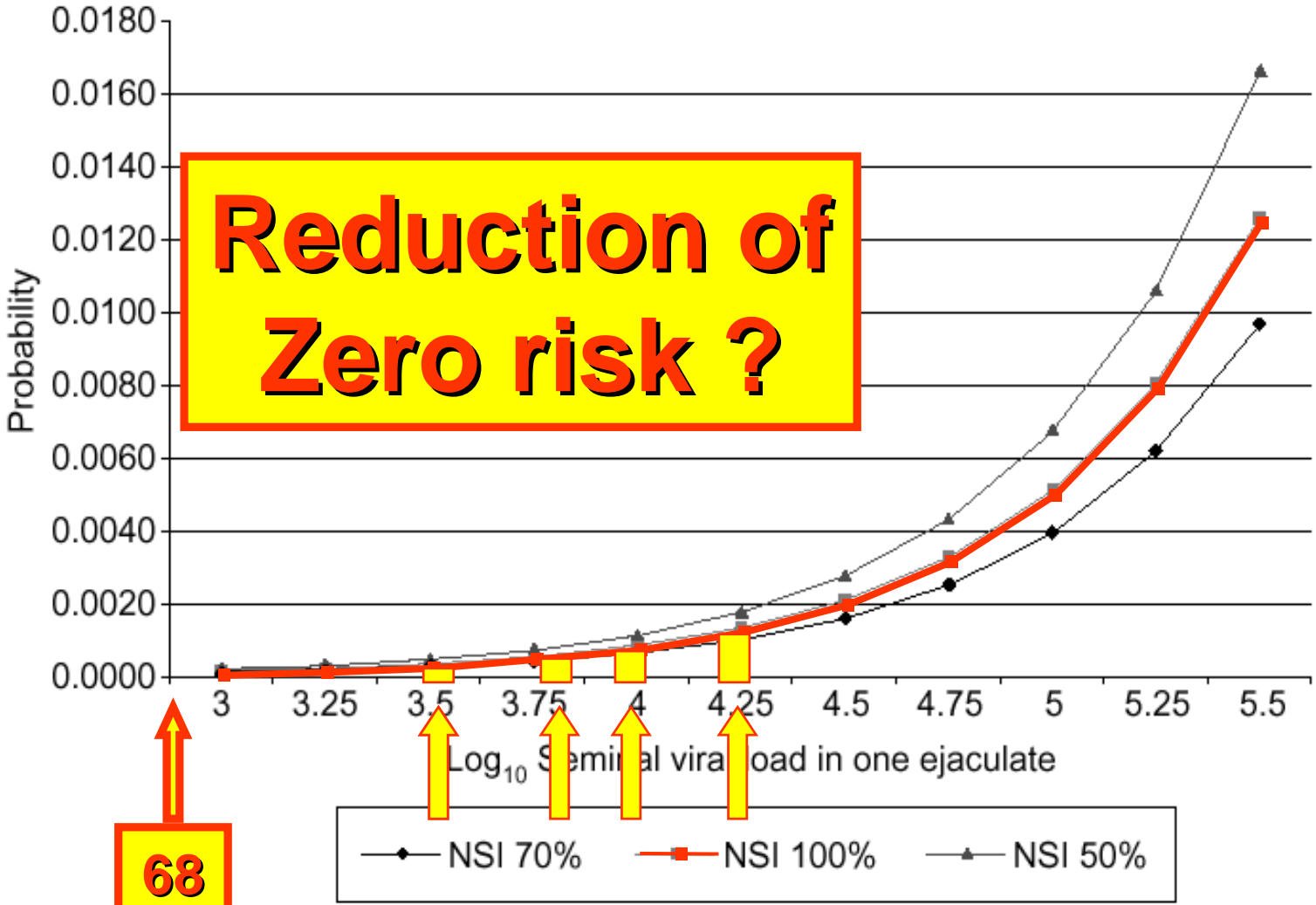


• ViroLogic single-cycle replication capacity assay

# Potential fields for PREP

- **High risk core groups**
  - Patients with frequent episodes of STDs
  - Commercial sex workers
- **HIV-discordant couples willing to conceive a child**
  - Insemination clinics: 35% no shows
  - Many „failures“ conceive by themselves

# Discordant couples and HIV Risk



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# St. Gallen approach for Insemination „failures“

- **HIV-Risk Counselling**
  - Evaluate fertility in both partners
  - Timing sexual intercourse at ovulation
  - Index patient is fully suppressed (HAART)
  - HIV-RNA not detectable in semen
  - Eliminate asymptomatic STDs
  - **PREP with Tenofovir**
    - 245mg single dose
    - 2 hrs before sexual contact

# Summary

## 1. Condoms are still method of choice



## 2. PREP evaluation is ongoing

## 3. PREP is currently not encouraged



1. Eindringen immer mit Gummi.
2. Sperma und Blut nicht in den Mund.

LOVE LIFE  
STOP AIDS

Herde Zellweger, das Bundesamt für Gesundheit und die Aids-Hilfe Schweiz. Safer Sex ist der beste Schutz gegen HIV und andere sexuell übertragbare Krankheiten. [www.love-life.ch](http://www.love-life.ch)