

# Antiretroviral treatment: WHO current trends and recommendations

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# Objectives of the Presentation

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- Review current trends in ARV treatment for adults.
  - Review WHO recommendations.
  - Show the ARV treatment's preventive impact.
  - The challenge of life expectancy.
  - The right to procreate.
  - Controversial situations.
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# Objectives of ARV treatment

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- Traditional objectives:
    - Prevent the progression to AIDS and death.
    - Prevent the risk of opportunistic infections
    - Restore immunity
    - Prevent mother-child transmission
  - New expectations:
    - Improve life expectancy
    - Prevent sexual transmission
    - Control the epidemic
    - Prevent non-AIDS related morbidity and mortality.
    - Prevent cardiovascular complications.
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# When to begin treatment

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According to current guides, when should we start ARV treatment?

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# Studies that support starting earlier

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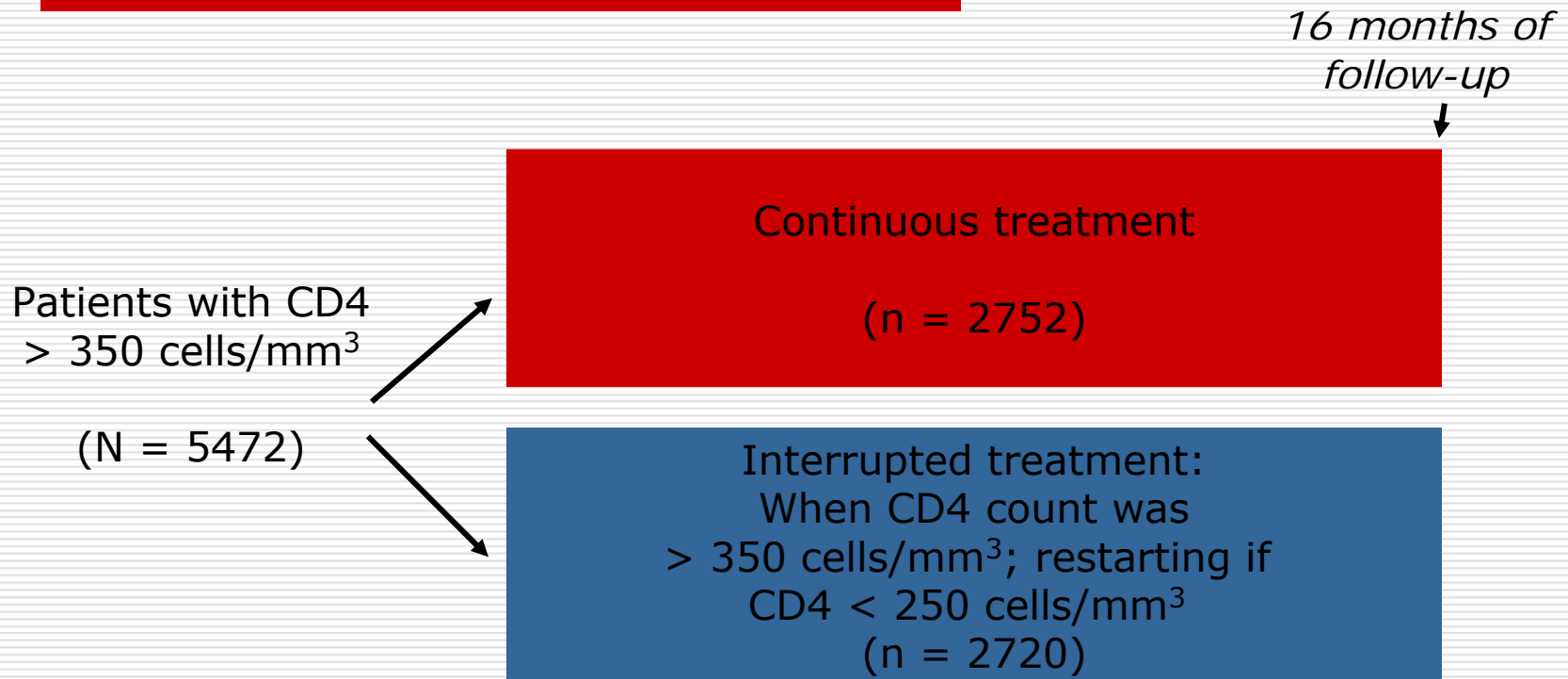
- SMART trial<sup>[1]</sup>
  - Reduces the risk of OIs and serious events that aren't AIDS related in patients who begin ARV treatment with  $> 350$  cells/mm<sup>3</sup>
- ART-CC<sup>[2]</sup>
  - Reduction of risk of AIDS and death when ARV begins with  $> 350$  cells/mm<sup>3</sup> versus  $\leq 350$  cells/mm<sup>3</sup>
- NA-ACCORD<sup>[3]</sup>
  - Benefit in survival when ARV begins earlier:
    - Risk of dying is 69% higher in patients who begin when CD4 are  $\leq 350$  cells/mm<sup>3</sup> vs 351-500 cells/mm<sup>3</sup>
    - Risk of dying is 94% higher in patients who begin ARV with  $\leq 500$  cells/mm<sup>3</sup> vs  $> 500$  cells/mm<sup>3</sup>

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1. Emery S, et al. J Infect Dis. 2008;197:1133-1144. 2. When to Start Consortium. Lancet. 2009;373:1352-1363. 3. Kitahata MM, et al. N Engl J Med. 2009;360:1815-1826.

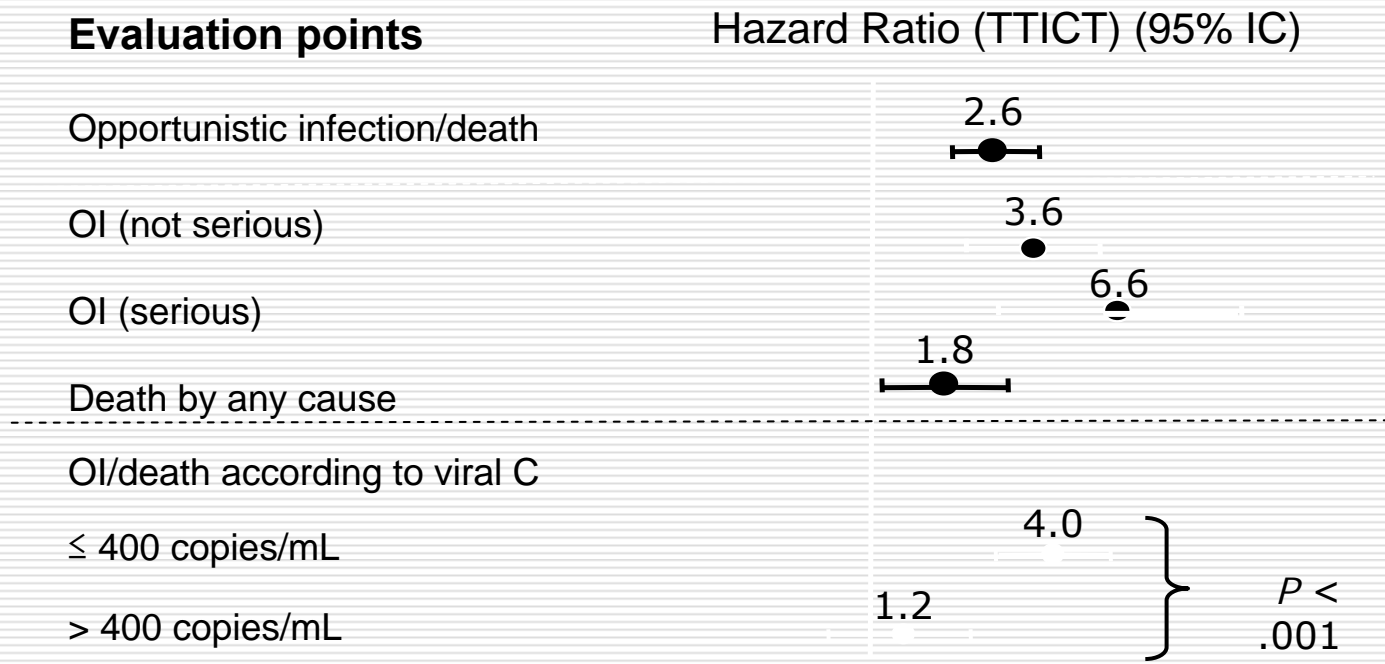
# SMART: Study design

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- Data monitoring and independent team security each year
    - **The Board** recommended that recruiting end on January 11, 2006
    - Significant security risk in the group with interrupted treatment
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# SMART: Higher risk of OIs and dying with interrupted ARV treatment.



\*Between those in ART at BL.

# SMART: Non-AIDS-related events and mortality according to study group

- Individuals with interrupted treatment frequently developed more serious cardiovascular, renal or liver diseases than individuals with continuous treatment.
- Individuals with interrupted treatment significantly developed adverse effects or death.

N, end point	Viral suppression Arm (n = 2752)	Interrupted treatment Arm (n = 2720)	HR (95% IC)*	P value
Cardiovascular, renal or liver serious disease	39	65	1.7 (1.1-2.5)	.009
Fatal/non fatal cardiovascular disease	31	48	1.6 (1.0-2.5)	.05
Fatal/non fatal renal disease	2	9	4.5 (1.0-20.9)	.05
Fatal/non fatal liver disease	7	10	1.4 (0.6-3.8)	.46
Grade IV events or death by any cause.	164	205	1.3 (1.0-1.6)	.03

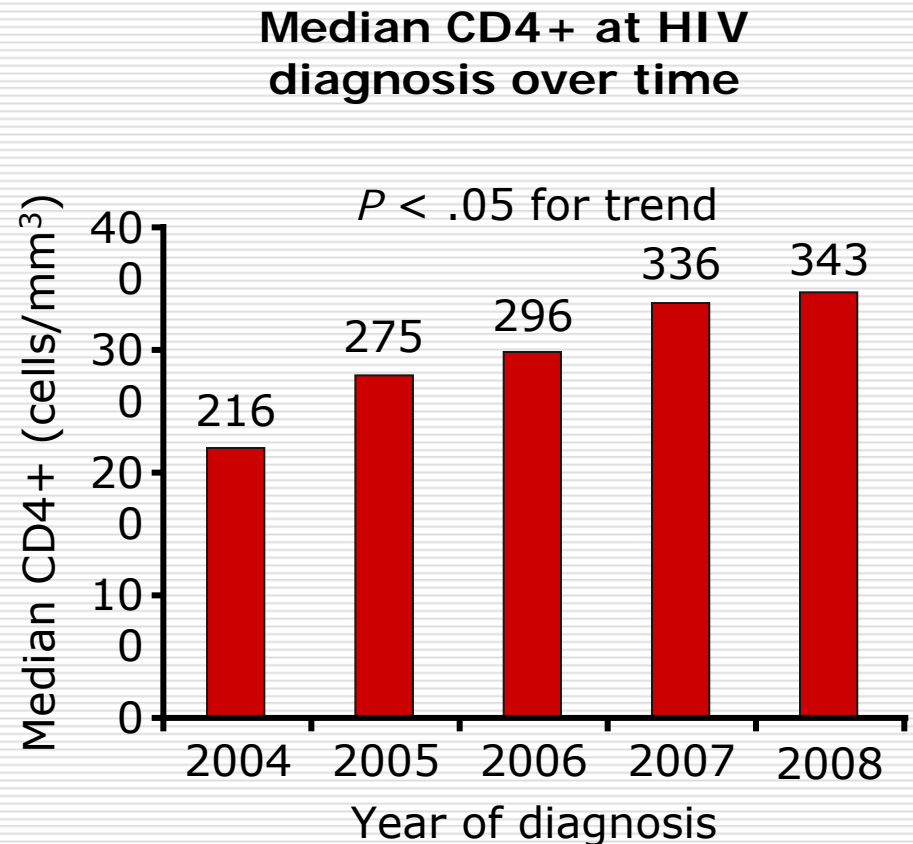
\*Group with interrupted treatment vs group with viral suppression.  
 El-Sadr WM, et al. N Engl J Med. 2006;355:2283-2296.

# International recommendations about when to begin ARV

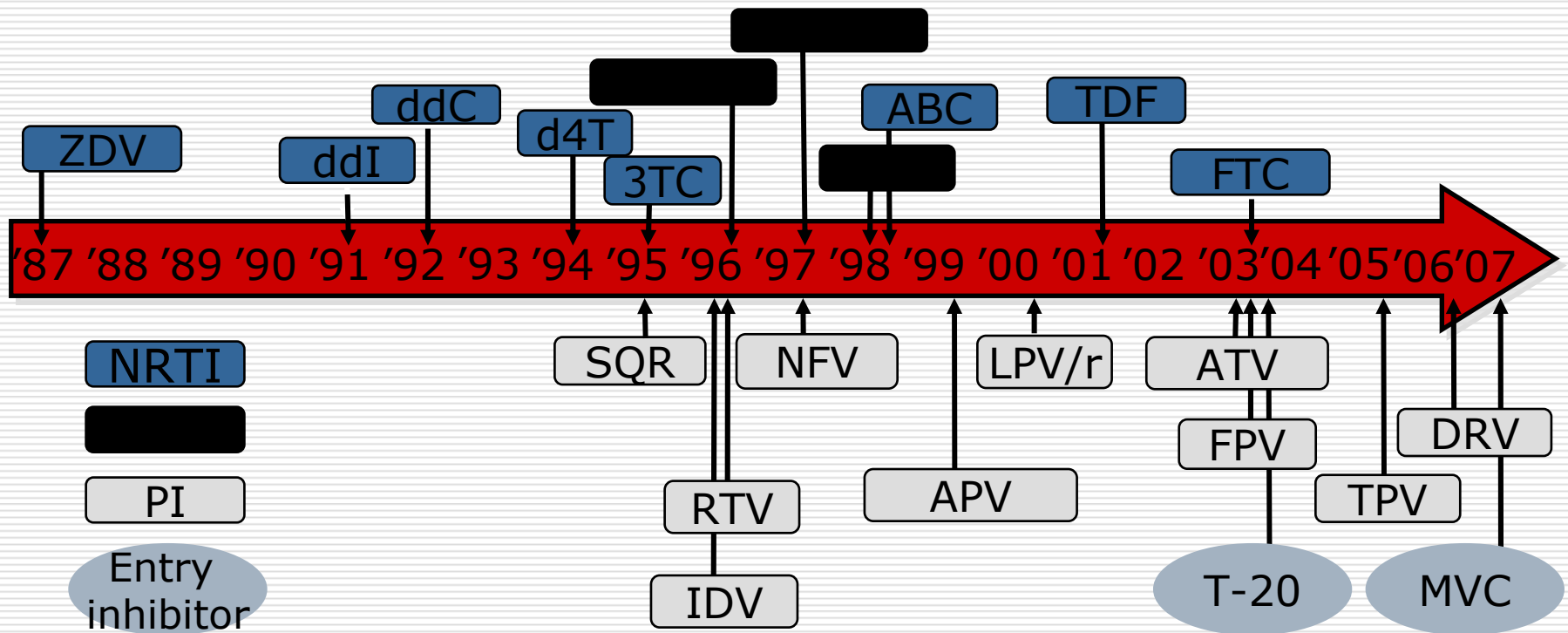
DHHS <sup>[1]</sup>	IAS-USA <sup>[2]</sup>
<ul style="list-style-type: none"><li>▪ Symptomatic HIV</li><li>▪ Asymptomatic; CD4+ count &lt; 350 cel/mm<sup>3</sup></li><li>▪ Pregnant</li><li>▪ HBV co-infection</li><li>▪ HIV-associated nephropathy</li><li>▪ Other considerations<ul style="list-style-type: none"><li>– Elderly</li><li>– Associated disease</li><li>– Reduction of CD4+ cel &gt; 120 cells/mm<sup>3</sup>/year</li><li>– Serodiscordant relations</li></ul></li></ul>	<ul style="list-style-type: none"><li>▪ Symptomatic HIV</li><li>▪ Asymptomatic; CD4+ count &lt; 350 cel/mm<sup>3</sup></li><li>▪ HIV-1 ARN &gt; 100,000 copies/mL</li><li>▪ Reduction of CD4+ cel count &gt; 100 cell/mm<sup>3</sup>/year</li><li>▪ HBV infection</li><li>▪ HCV infection</li><li>▪ Cardiovascular disease</li><li>▪ HIV-associated nephropathy</li><li>▪ Other considerations<ul style="list-style-type: none"><li>– Mother-child transmission</li><li>– Serodiscordant relations</li></ul></li></ul>
<p>1. DHHS guidelines. November 3, 2008. Available at: <a href="http://www.aidsinfo.nih.gov">http://www.aidsinfo.nih.gov</a>. Accessed January 12, 2009. 2. Hammer SM, et al. JAMA. 2008;300:555-570.</p>	

# Impact of extending VCT availability in Washington, DC

- A 3.7x increase of performing the test after advertising it in Washington, DC, 2004-2008
  - 2004: 19,766
  - 2008: 72,866
- 17% increase in the number of new HIV/AIDS cases based on 2004-2007 reports
- Significant reduction of AIDS progression after HIV Dx 2004-2008 ( $P < .0001$ )
- Time improvement between Dx and access to treatment 2004-2008.



# ARV development over time



23 unique ARV agents during the first year, FDA approved

# First line regimens: NRTI

## Which at to use and why? 2007

### DHHS Guidelines “Preferred,” October 2006<sup>[1]</sup>

NNRTI-based regimen

EFV\*

PI-based regimen

ATV/RTV

FPV/RTV BID

LPV/RTV BID

+

TDF/FTC

ZDV/3TC

### IAS-USA Guidelines “Recommended,” August 2006<sup>[2]</sup>

NNRTI-based regimen

EFV

NVP†

PI-based regimen

LPV/RTV

ATV/RTV

FPV/RTV

SQV/RTV

+

TDF/FTC‡

ZDV/3TC§

ABC/3TC§

\*Except during the first trimester of pregnancy or in women with high risk of potential pregnancy. †Avoid in women with CD4+ cel count > 250 cel/mm<sup>3</sup> and men with > 400 cel/mm<sup>3</sup>. ‡O lamivudine. §O emtricitabine.

# Recommended schemes: 2010

## □ NNRTI + 2 NRTIs *or* reinforced PI + 2 NRTIs

Recommendation	NNRTI	PI	NRTI
Preferably	EFV*	ATV/RTV QD DRV/RTV QD FPV/RTV BID LPV/RTV BID or QD RAL?	TDF/FTC <sup>†</sup>
Alternate	NVP <sup>‡</sup>	ATV QD FPV/RTV QD FPV BID SQV/RTV BID	ABC <sup>§</sup> /3TC ddl + 3TC ZDV/3TC

\*Except during the first trimester of pregnancy or in women with high risk of potential pregnancy. Use with caution on patients with unstable psychiatric disease. <sup>†</sup>O 3TC. <sup>‡</sup>Only in women with CD4+ cel count < 250 cells/mm<sup>3</sup> or in men with CD4+ cel count < 400 cells/mm<sup>3</sup>. <sup>§</sup>Use only if HLA-B\*5701 is negative. Use with caution on patients with cardiovascular risk or VIH-1 ARN > 100,000 replicas/mL.

DHHS guidelines. Available at: <http://www.aidsinfo.nih.gov>.  
Accessed January 12, 2009.

# ABC/3TC versus ZDV/3TC

## □ CD4+ increase

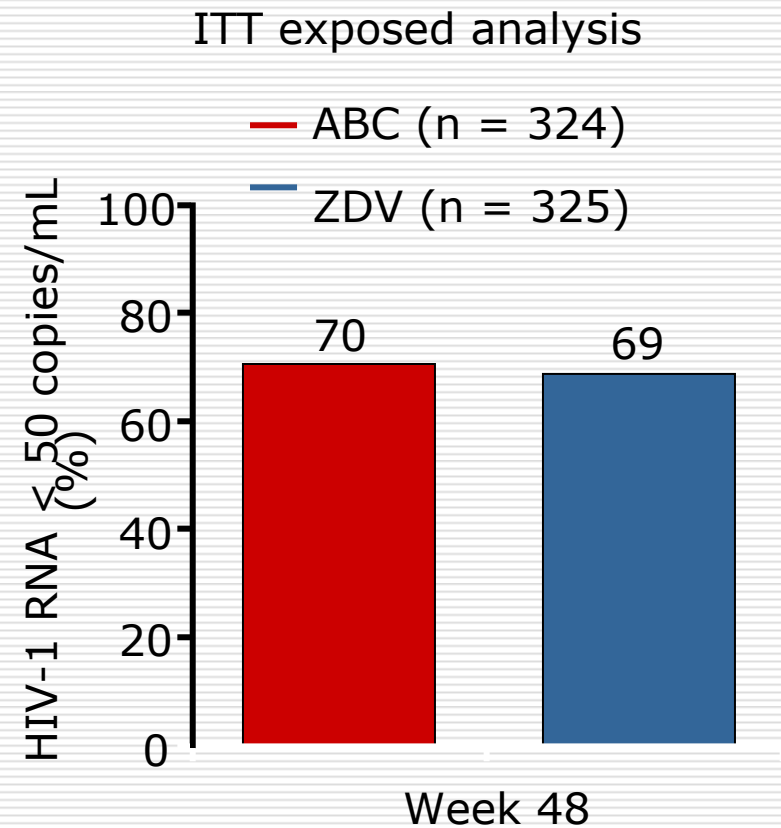
- ABC = 209 vs ZDV = 155  
( $P = .005$ )

## □ Interruptions x EA

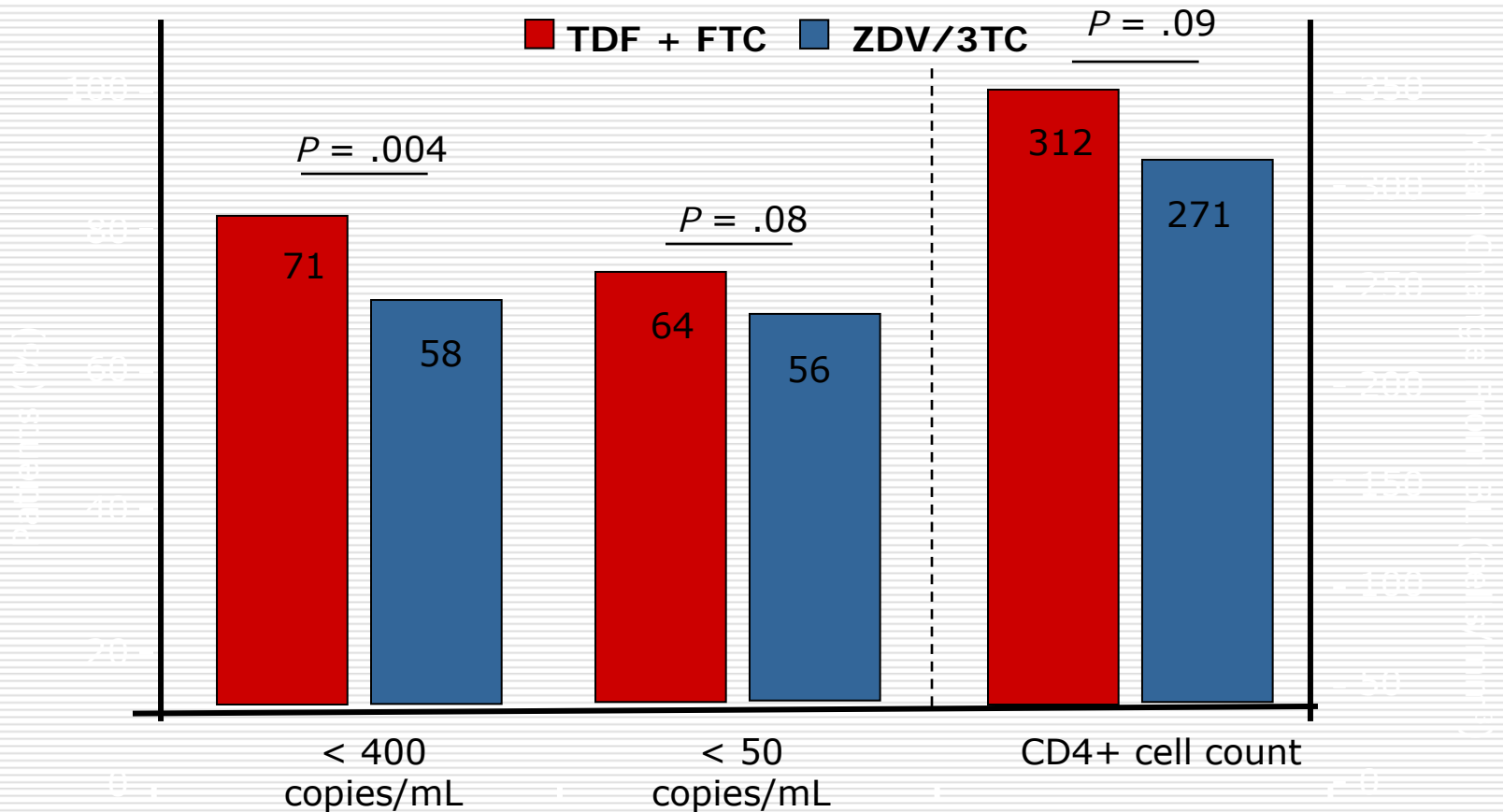
- ABC = 14% vs ZDV = 18%

## □ AEs

- ABC: HSR
- ZDV anemia, fatigue, GI symptoms



# GS934: Loss of virologic response time: TDF-FTC vs ZDV-3TC



# GS934: Resistance development by week 144

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	TDF + FTC (n = 244)	ZDV/3TC (n = 243)
Patients with genotype, n (%)	19 (8)	29 (12)
Wild type, n	6	7
Some resistance, n	13	22
EFV mutation resistance, n	13	21
M184V/I, n	2	10*
TAMs, n	0	2
K65R, n	0	0

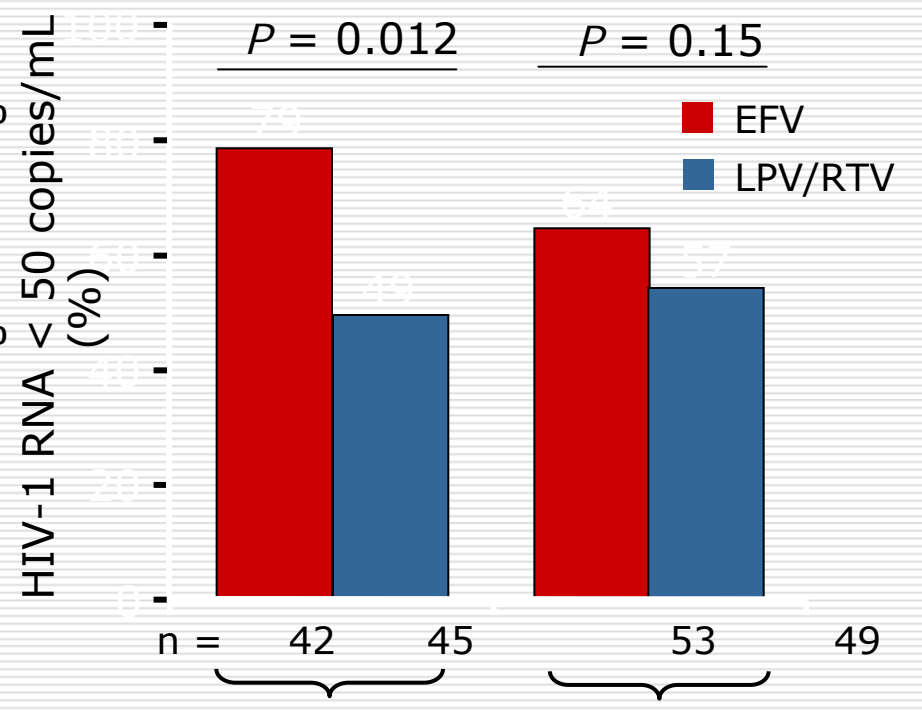
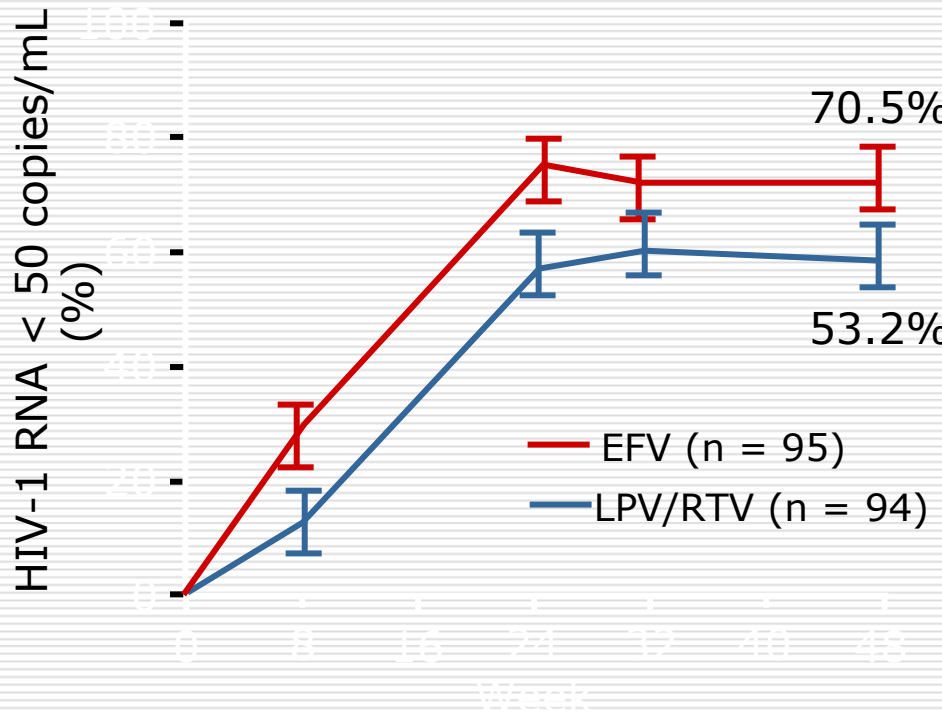
\* $P = .02$

$P = 0.037$

- No appearance of K65R during 3 years
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# EFV vs LPV/RTV: HIV-1 viral load < 50 copies/mL by week 48

□ EFV reached the superiority criteria for LPV/RTV:  $\Delta$  17% (CI 95%: 3.5% to 31.0%;  $P = .017$ )

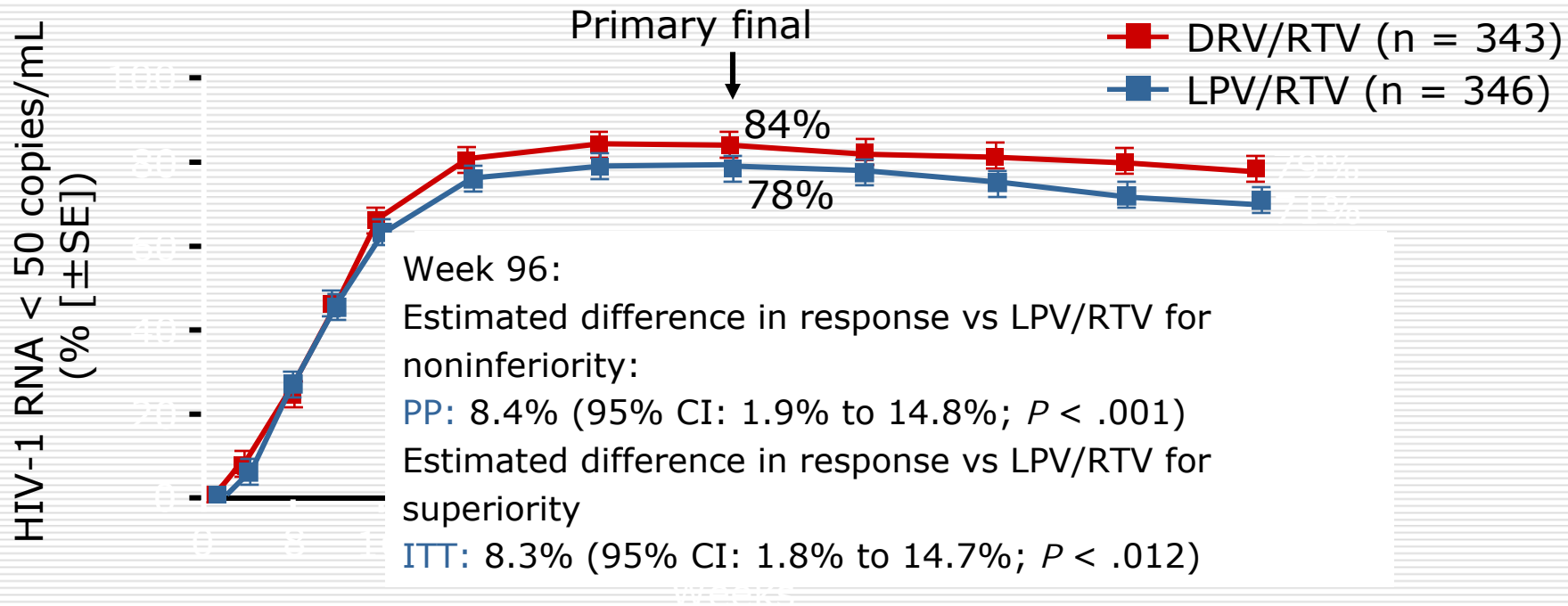


	Week 8	Week 24	Week 32	Week 40	Week 48
No. of patients with HIV -1 RNA < 50 copies/mL					
EFV	29	70	68		67
LPV	8	53	56		50

By BL CD4+ count

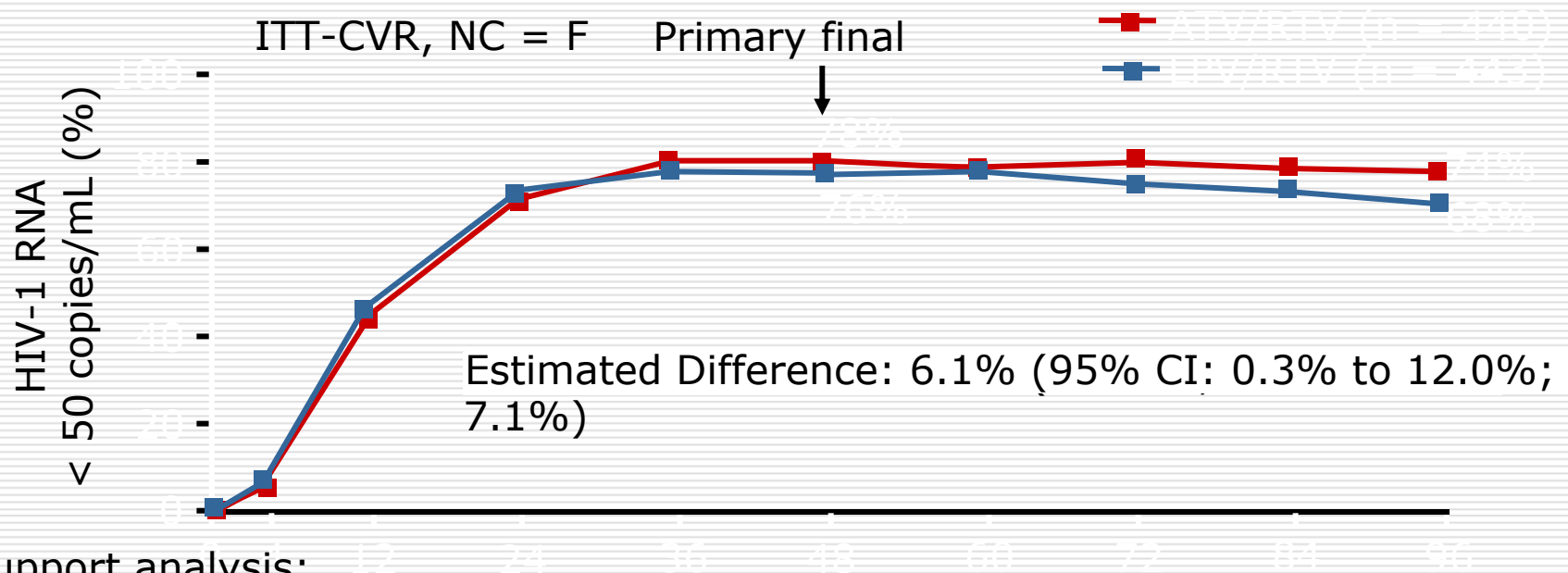
Madero JS, et al. IAC 2008. Abstract TUAB0104. Permission granted to CCO for use of this graphic.

# ARTEMIS: Week 96 response to DRV/RTV vs LPV/RTV in naive patients



- Superiority is also observed in week 96 when compared to DRV/RTV (n = 343) are patients treated only with LPV/RTV BID (n = 258)
  - 79% vs 72% ( $P = .038$ )

# CASTLE: Week 96 response to ATV/RTV vs LPV/RTV in naive patients



Support analysis:

ITT-TLOVR: HIV-1 RNA < 50 copies/mL: ATV/RTV 70%; LPV/RTV 63%; 6.6% (0.4% to 12.7%)

OT-VR-OC: HIV-1 RNA < 50 copies/mL: ATV/RTV 89%; LPV/RTV 88%; 1.6% (-3.1% to 6.2%)

# NNRTIs versus reinforced PI

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Regimen	Pros	Cons
NNRTI based	<ul style="list-style-type: none"> <li>▪ Long half life</li> <li>▪ Lower metabolic toxicity than ÚQ</li> <li>▪ Maintains ÚQ activity for future scheme.</li> <li>▪ Low price</li> </ul>	<ul style="list-style-type: none"> <li>▪ Genetic barrier. A mutation confers R to all the group.</li> <li>▪ Cross-resistance between EFV and NVP</li> <li>▪ Higher number of R mutations after the first failure</li> <li>▪ Rash and hepatotoxicity</li> <li>▪ Interactions (CYP450)</li> </ul>
PI based	<ul style="list-style-type: none"> <li>▪ Higher genetic barrier</li> <li>▪ Lower risk of R to ÚQ and NRTI after failure</li> <li>▪ NNRTI are maintained for the next scheme.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Some ÚQ with metabolic complications</li> <li>▪ Variable gastrointestinal tolerance</li> <li>▪ Multiple interactions (CYP450).</li> <li>▪ TB treatment complication</li> </ul>

# WHO Recommendations

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2009-2010

Should we follow them all?

# RECOMMENDATION 1

## When to begin

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- Start antiretroviral treatment in all patients with HIV with a CD4 load  $\leq 350$  cells/mm<sup>3</sup>, regardless of clinical symptoms. (Strong recommendation, moderate quality of evidence)
  - A CD4 load test is required to identify if patients with stage 1 or 2 clinical HIV need to begin antiretroviral treatment.  
(Strong recommendation, low quality evidence)
  - Start antiretroviral treatment in all patients with stage 3 or 4 clinical HIV and, regardless of CD4 load.  
(Strong recommendation, low quality evidence)
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# RECOMMENDATION 2

## What to begin with

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Begin with one of the following eligible ARV regimens for treatment:

- AZT +3TC+EFV
- AZT +3TC+NVP
- TDF +3TC or FTC+EFV
- TDF +3TC or FTC+NVP

(Strong recommendation, moderate quality of evidence)

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# RECOMMENDATION 5

## ARV for pregnant women

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- Start antiretroviral treatment in all pregnant women with HIV with a CD4 load  $< 350$  cells/mm<sup>3</sup>, regardless of clinical symptoms.  
(Strong recommendation, moderate quality of evidence)
  
  - CD4 load test required to identify if pregnant women with stage 1 or 2 clinical HIV need to begin antiretroviral treatment or prophylaxis.  
(Strong recommendation, low quality evidence)
  
  - Start antiretroviral treatment in all pregnant women with stage 3 or 4 clinical HIV and WHO clinical stages 3 or 4, regardless of CD4 load.  
(Strong recommendation, low quality evidence)
-

# RECOMMENDATION 5

## ARV for pregnant women cont...

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- Start one of the following regimens in naive patients eligible for ARV treatment:

AZT +3TC+EFV

AZT +3TC+NVP

TDF +3TC or FTC+EFV

TDF +3TC or FTC+NVP

(Strong recommendation, moderate quality of evidence)

- Do not start EFV during the first trimester of pregnancy.

(Strong recommendation, low quality evidence)

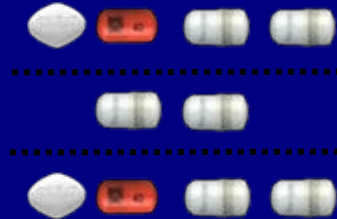
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# Treatment simplification\*

## 1996 - 2006



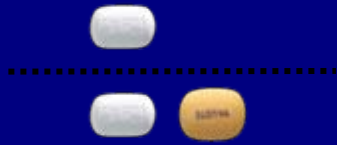
1996: d4T/3TC/IDV  
10 pills, TID



1998: ZDV/3TC/EFZ  
5 pills, BID



2002: ZDV/3TC/EFV  
3 pills, BID



2004: TVD or EPZ /EFV  
2 pills, QD



2006: ATRIPLA  
1 pill, QD



Selected regimens

# When to use the resistance test

	IAS-USA <sup>[1]</sup>	DHHS <sup>[2]</sup>	European <sup>[3]</sup>
Primary/acute	Recommended	Recommended	Recommended
Post-exposure prophylaxis	--		Recommended*
Chronic, tx naive	Recommended	Recommended	Recommended
Failure	Recommended	Recommended	Recommended
Pregnancy	Recommended	Recommended	Recommended
Pediatric	--	Recommended	Recommended

\*Patient test sources, especially if treated with antiretroviral drugs

1. Hirsch MS, et al. Clin Infect Dis. 2008;47:266-285. 2. DHHS guidelines. Available at: <http://www.aidsinfo.nih.gov>. Accessed February 12, 2009. 3. EACS Guidelines Version 3. Available at: <http://www.eacs.eu/guide/index.htm>. Accessed October 24, 2008.

# CDC-USA trend surveillance for ARV resistance in recently diagnosed patients.

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	Prevalence or resistance to drugs, %				
	1998 <sup>[1]</sup> (n = 257)	1999 <sup>[1]</sup> (n = 239)	2000 <sup>[1]</sup> (n = 299)	2003- 2004 <sup>[2]</sup> (n = 633)	2003- 2006 <sup>[3]</sup> (n = 3130)
Any drug	5.5	8.8	10.7	14.5	10.4
NRTI	5.1	7.1	7.7	7.1	3.6
NNRTI	0.4	2.1	1.7	8.4	6.9
PI	0	0.8	3.0	2.8	2.4
≥ 2 types of drugs	0	1.3	1.3	3.1	1.9

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1. Bennett D, et al. CROI 2002. Abstract 372. 2. Bennett D, et al. CROI 2005. Abstract 674.

3. Wheeler W, et al. CROI 2007. Abstract 648.

# RCTs: % VL<50c/mL

Naive trials	
GEMINI	64-65%
KLEAN	65-66%
ACTG 5142 (Wk96)	77-89%
Artemis	78-84%
Merit	65-69%
MK 004	87%
Castle	76-78%
HEAT	67-68%

Test trials		≥ 2 active agents
Benchmrk	64%	75%
Victor E1 (Wk 24)	64%	67-72%
MOTIVATE	42-47%	52-61%
POWER	46%	73%
DUET	60-61%	66-80%
MK 004	87%	n/a
TITAN	61-70%	60-80%

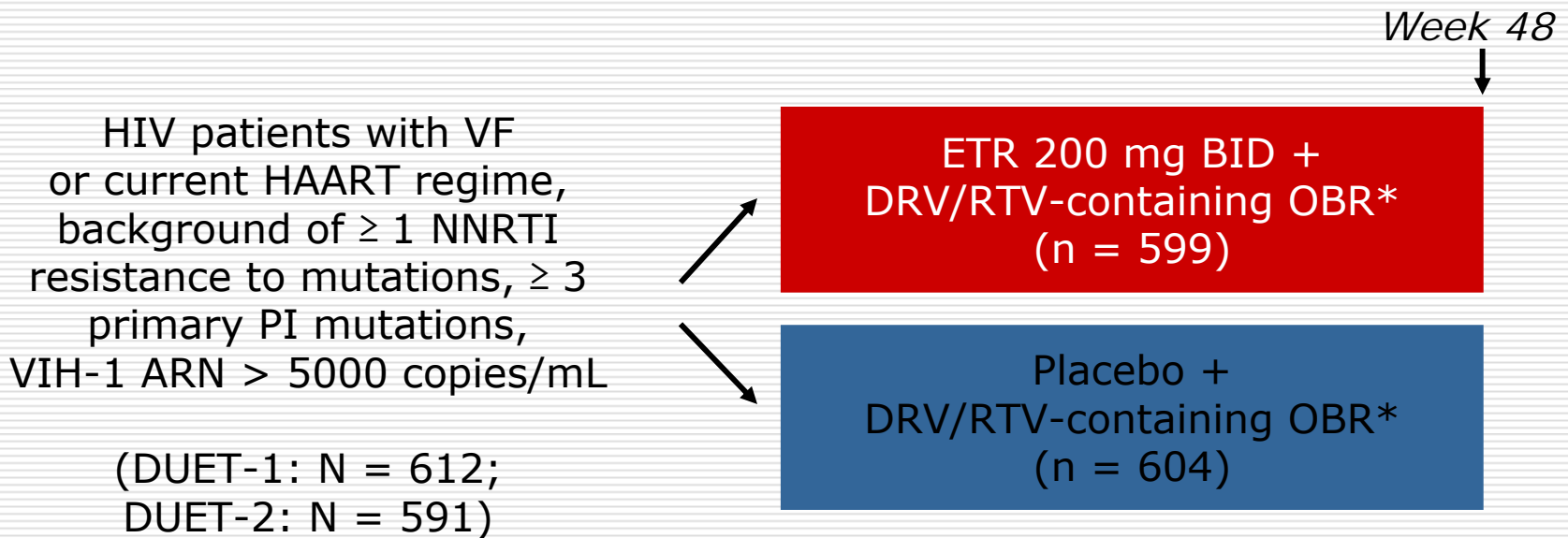
# New rescue drugs

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- From the DUET study:
    - Etravirine + Darunavir-ritonavir + OBR
    - Response higher than 70%
  - From the TRIO study:
    - Etravirine + Darunavir-ritonavir + Raltegravir
    - Response from experimented patients: 90% undetectable in week 48: the same as a naive patient.
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# DUET-1 and -2: ETR + DRV/RTV + OBR

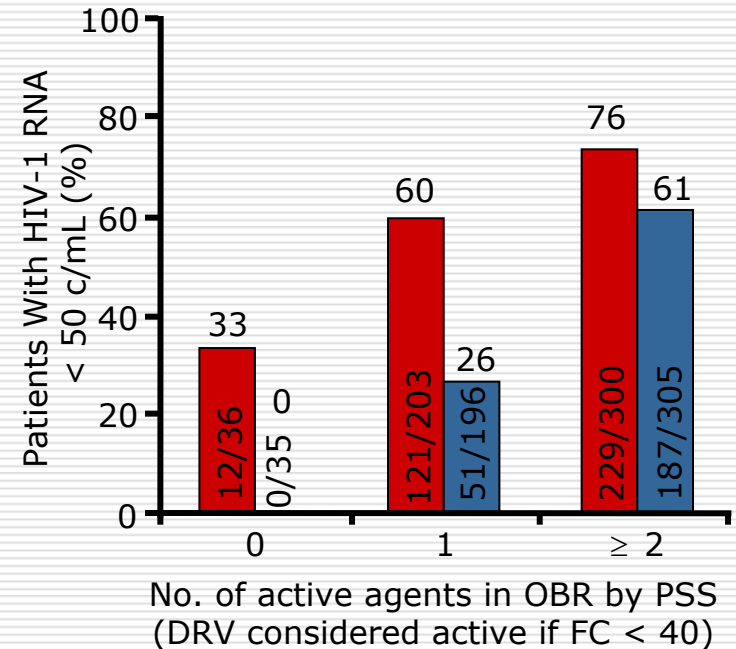
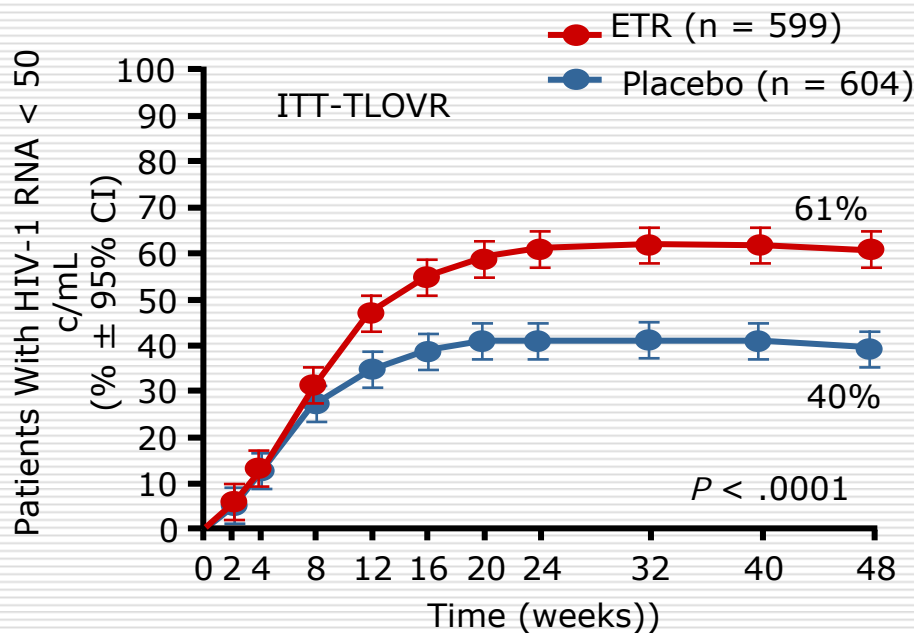
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\*The researcher selected OBR consistent in DRV/RTV (600/100 mg/mL BID) +  $\geq 2$  NRTIs  $\pm$  ENF.

# DUET by week 48 with a viral load lower than 50

- Major changes to the response of CD4+ count by week 40 significantly higher with etravirine arm: +98 cel/mm<sup>3</sup> vs +73 cel/mm<sup>3</sup> with placebo<sup>[1,2]</sup>



1. Haubrich R, et al. CROI 2008. Abstract 790. 2. Johnson M, et al. CROI 2008. Abstract 791.  
3. Winters B, et al. CROI 2008. Abstract 873.

# WHO Recommendations

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2009-2010

Should we follow them all?

# RECOMMENDATION 3

## ARV for HIV/TB co-infection

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□ Start antiretroviral treatment in all individuals infected with HIV and active TB regardless of the CD4 count.

(Strong recommendation, low quality evidence)

□ Begin treatment for TB, followed by ARV as soon as possible after starting treatment for TB.

(Strong recommendation, moderate quality of evidence)

□ Use efavirenz (EFV) as the non-nucleoside reverse transcriptase inhibitor (NNRTI) in patients who have initiated ARV while in TB treatment. (Strong recommendation, high quality of evidence)

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# RECOMMENDATION 6

## When to change ARV

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- ❑ Where available, use the viral load (VL) to confirm treatment failure.  
(Strong recommendation, low quality evidence)
  - ❑ Where routinely available, use viral load (VL) every 6 months to detect viral replication (Conditional recommendation, low quality evidence)
  - ❑ A persistent viral load over 5,000 copies/ml indicates treatment failure.  
(Conditional recommendation, low quality evidence)
  - ❑ If viral load is not available, use immunological criteria to confirm clinical failure.  
(Strong recommendation, moderate quality of evidence)
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# RECOMMENDATION 7

## Second line ARV

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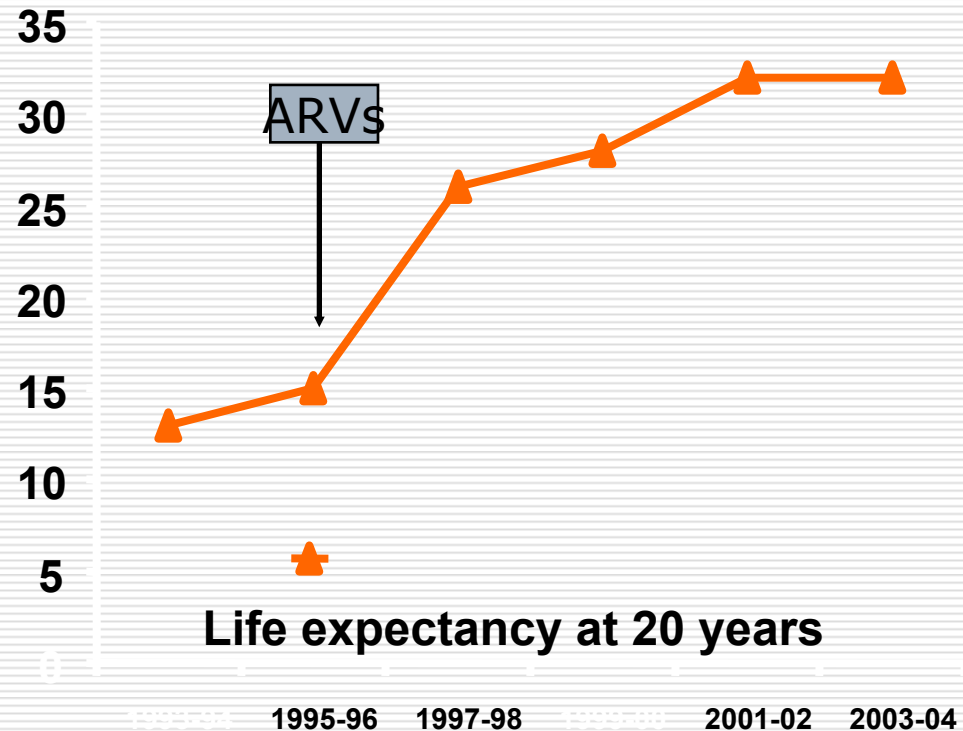
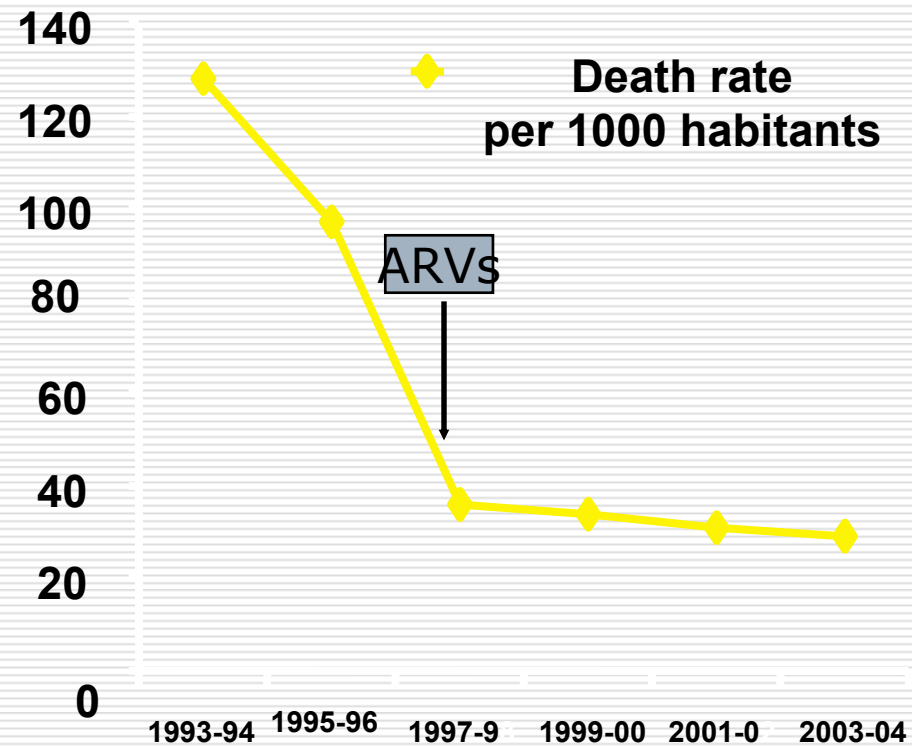
- ❑ A potentiated protease inhibitor (PI/r) plus two analog nucleosides (NRTIs) are recommended with second line ARV. (Strong recommendation, moderate quality of evidence)
  - ❑ ATV/r and LPV/r are potentiated with PI's preferred for second line ARV. (Conditional recommendation, moderate quality evidence).
  - ❑ Simplification of NRTI second options is recommended:
  - ❑ If d4T or AZT has been used for the first line, use TDF plus 3TC or FTZ as the NRTI background in the second line.
  - ❑ If TDF was used in the first line, use AZT plus 3F as the NRTI background in the second line. (Strong recommendation, moderate quality evidence)
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# The impact of ARV treatment in prevention

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Is access to ARV's a way to control  
epidemic?

# Impact of the use of ARVs in BC, Canada

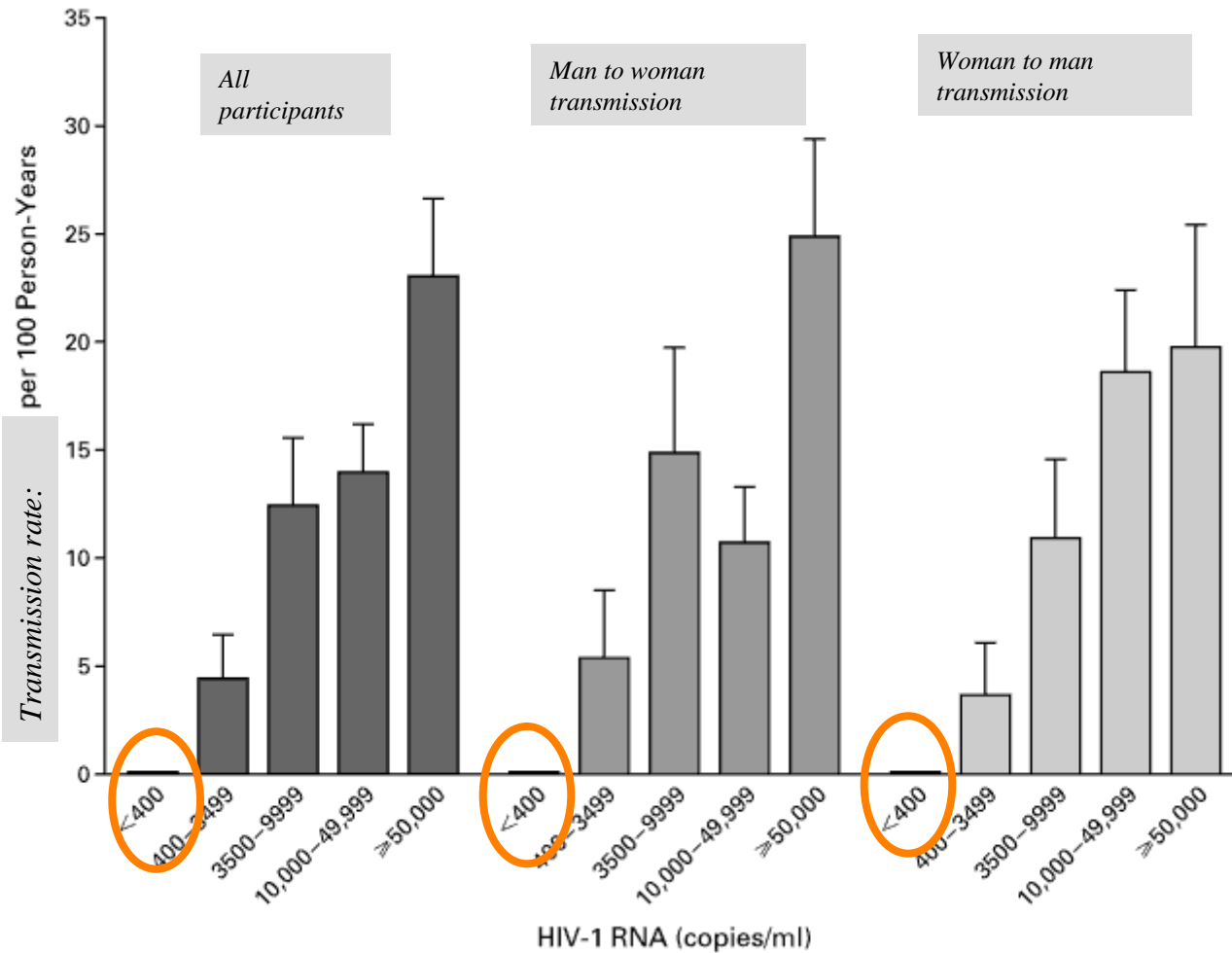


# The beginning of ARV in serodiscordant couples in Africa reduces the risk of transmission

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- 92% reduction of HIV transmission in serodiscordant couples in Africa, when ARV is initiated:
  - 102 of 103 confirmed cases of HIV transmission in serodiscordant couples, occurred in couples who did NOT take ARV:
    - Non-adjusted relative risk: 0.17 (95% CI: 0.004-0.94; P = .037)
    - Adjusted relative risk: 0.08 (95% CI: 0.002-0.57; P = .004)

# Discordant couples



# Proposal to Evaluate the Impact of ARV Expansion on HIV Prevalence

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**Coverage with  
HAART**

**Reduction of  
HIV transmission**

**0%**

**0%**

**30%**

**50%**

**50%**

**XX%**

# Difficulties in the expansion of the use of ARV for HIV prevention

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- ✓ Hypothesis that has not been evaluated
- ✓ ARV safety and toxicity
- ✓ The right of patients to reject treatment
- ✓ ARV resistance
- ✓ Hidden epidemics
- ✓ Logistics
- ✓ Erosion of prevention efforts
- ✓ Cost

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This hypothesis needs to be explored

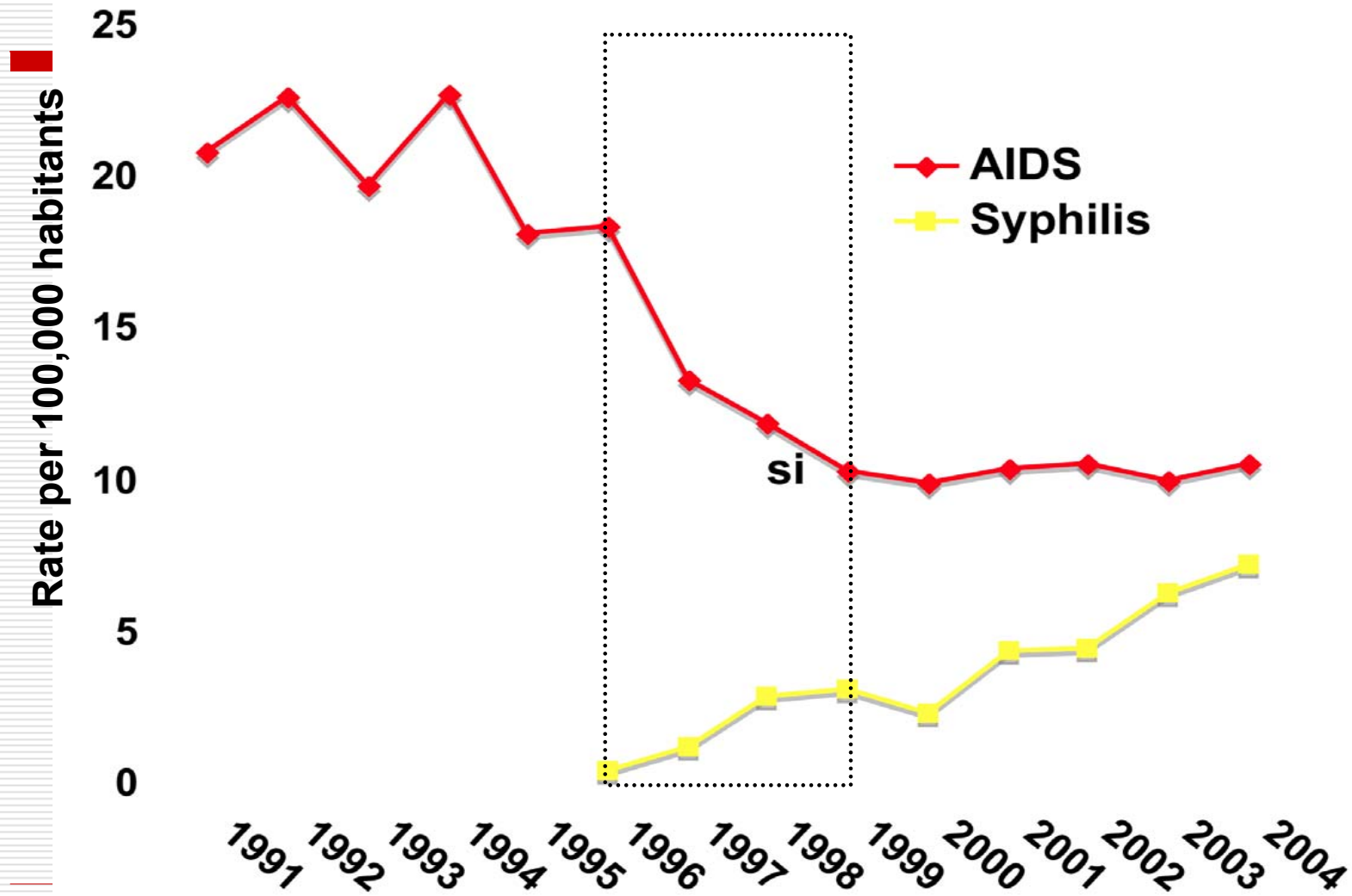
# Acute infection: Viral load level and mother-child transmission.

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- The risk of transmission is correlated to the viral load level. ( $P < .001$ )
- Treatment to reduce the risk of transmission should be offered.

HIV-1 ARN maternal level, %	Infected children
< 1000 copies/mL (n = 57)	0
1000-10,000 copies/mL (n = 193)	16.6
> 10,000-50,000 copies/mL (n = 183)	21.3
> 50,000-100,000 copies/mL (n = 54)	30.9
> 100,000 copies/mL (n = 64)	40.6

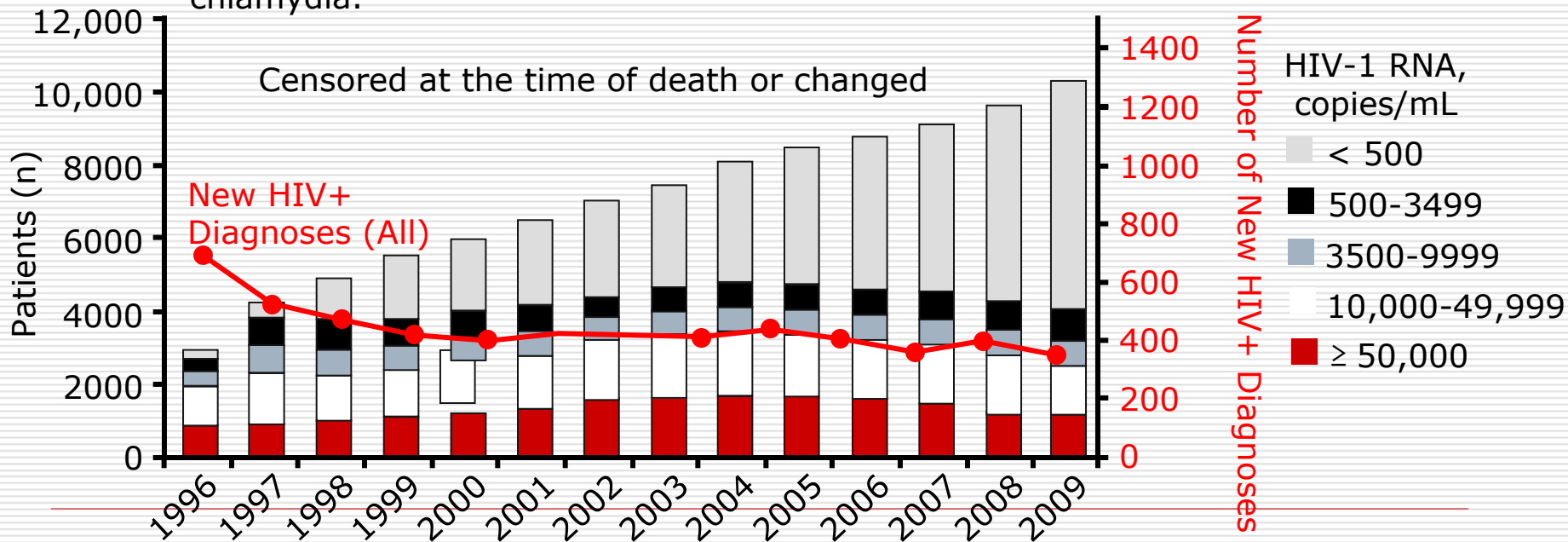
# New HIV and Syphilis cases in British Columbia



# Reduction of new HIV cases in BC: VCT and ARV reach the community level

- The reduction period of new HIV diagnoses in BC concurred with an increase in the average number of HIV tests, and increase in the use of ARV therapy, and a decrease of the community's viral load (1996-2008)

■ Reduction of new HIV diagnoses despite the increase in syphilis, gonorrhea and chlamydia.

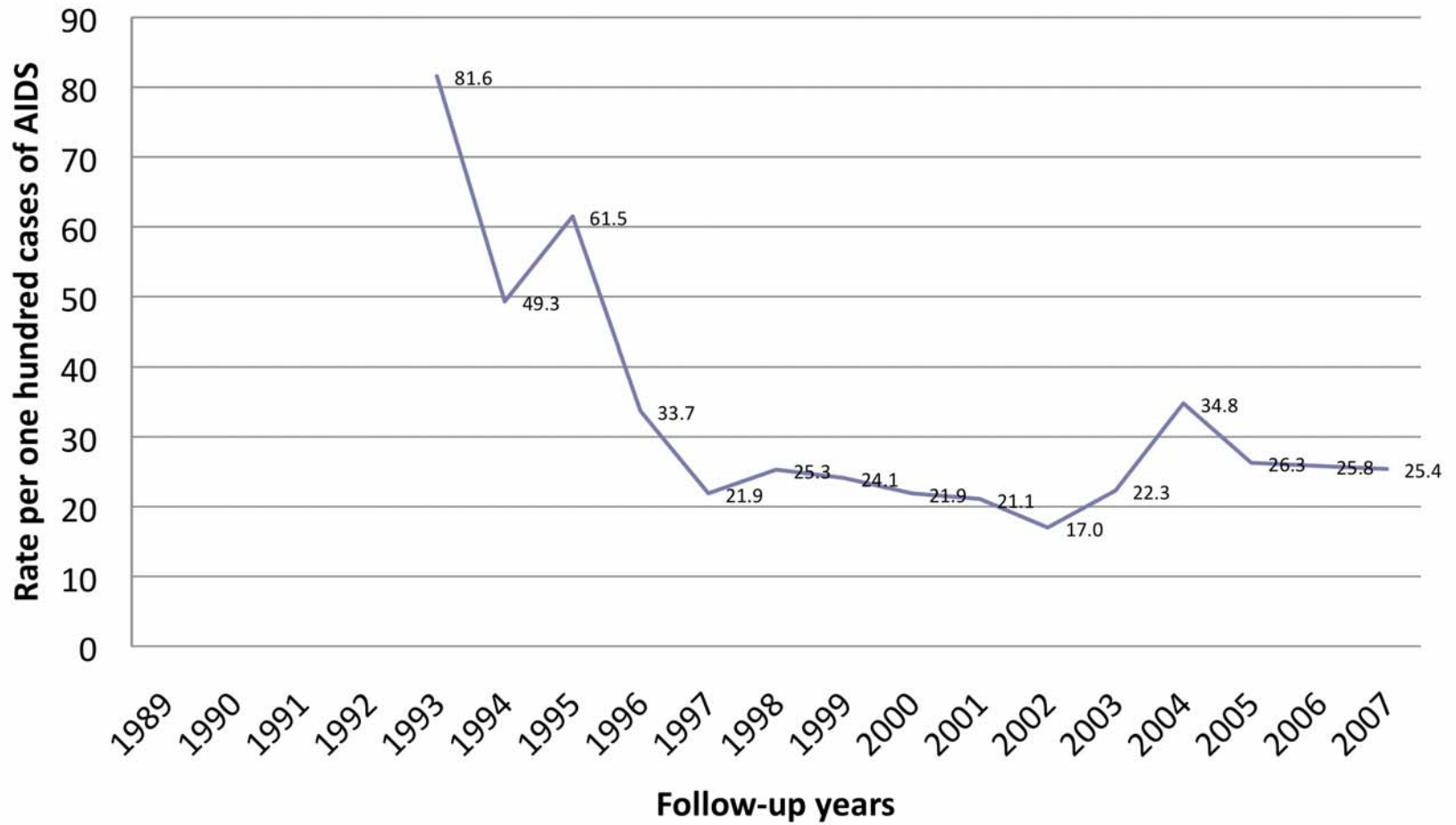


# Antiretroviral Treatment in a Reference Center. 10 years of HAART availability

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Department of Medicine  
Infectious Diseases Clinic  
Hospital Roosevelt  
Guatemala City

### Mortality rate of hospitalized HIV positive patients and AIDS deaths from the Infectious Diseases Clinic Hospital Roosevelt 1989 - April 2005



# First cohort 2001-2005

(Poster IAS Rio Janeiro 2005): H Roosevelt-MSF Suiza

<b>Patients</b>	<b>2001-2002</b>	<b>2003</b>	<b>2004</b>	<b>2005 (6 m)</b>	<b>Total</b>
<b>Initial</b>	<b>142</b>	<b>186</b>	<b>306</b>	<b>171</b>	<b>805</b>
<b>Active</b>	<b>125</b>	<b>264</b>	<b>499</b>	<b>626</b>	<b>626</b>
<b>Deceased</b>	<b>4</b>	<b>8</b>	<b>24</b>	<b>9</b>	<b>45 (5.6%)</b>
<b>Abandoned</b>	<b>2</b>	<b>13</b>	<b>28</b>	<b>22</b>	<b>65 (8%)</b>
<b>Referrals</b>	<b>8</b>	<b>23</b>	<b>23</b>	<b>10</b>	<b>64 (8%)</b>
<b>Suspended</b>	<b>3</b>	<b>8</b>	<b>10</b>	<b>5</b>	<b>26 (3.3%)</b>

# Monitoring Analysis: VL

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**Average VL before HAART:  
306.378 copies/ml**

<b>Time after H A A R T</b>	<b>N°</b>	<b>% of patients with undetectable VL*</b>
<b>At 6 months</b>	<b>404</b>	<b>84.9 %</b>
<b>At 12 months</b>	<b>216</b>	<b>77.3 %</b>
<b>At 24 months</b>	<b>71</b>	<b>88.7 %</b>

\* Undetectable: less than 50 copies/ml

# Monitoring Analysis: CD4

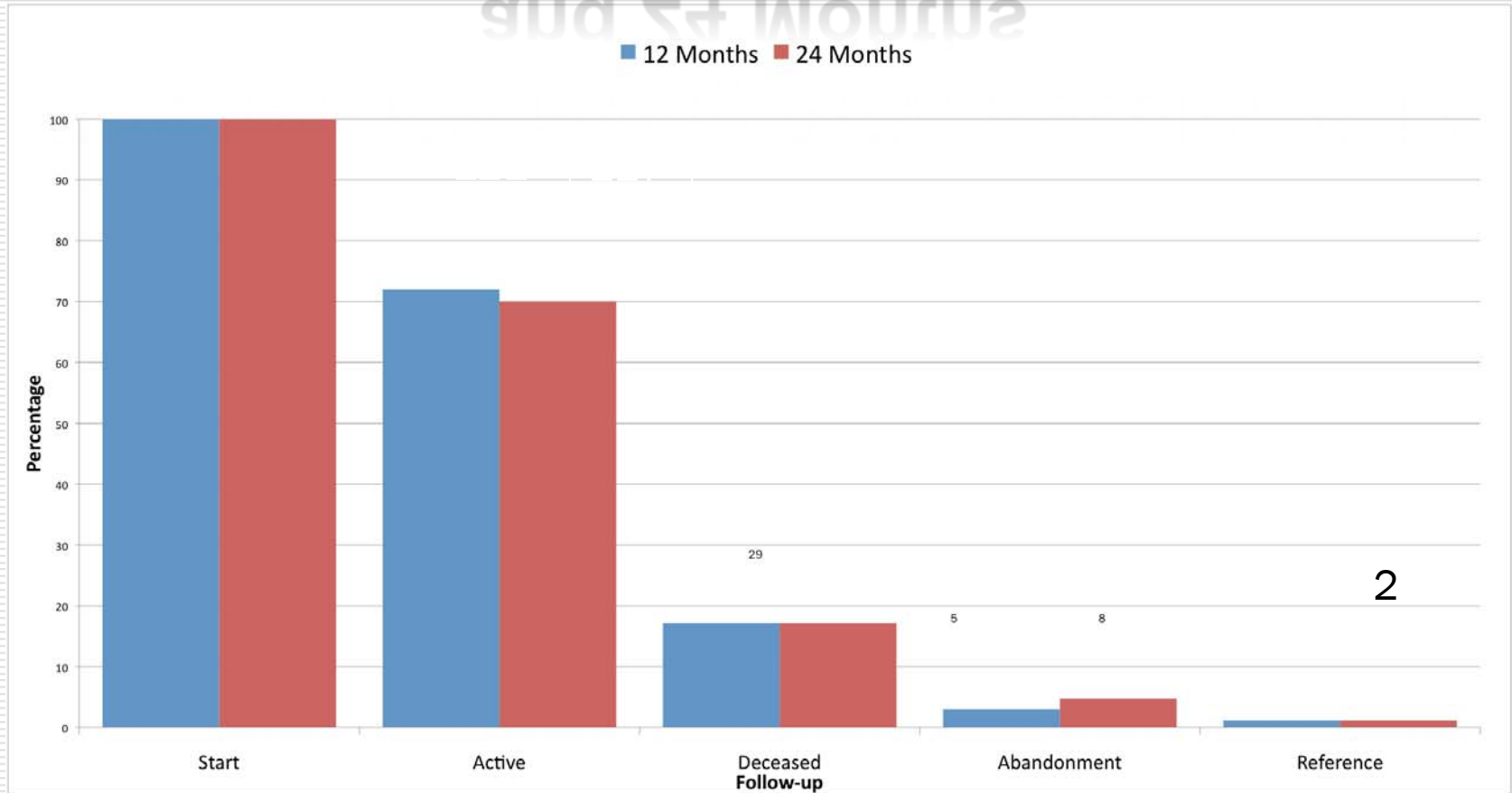
Initial (N 730) (before TARGA)		CD4 average: 107/mm <sup>3</sup>			
		35.3% (N 258) CD4 < 50/mm <sup>3</sup> 81.1% (N 692) CD4 < 200/mm <sup>3</sup>			
Time	Median CD4	N <sup>o</sup>	CD4 increase > 50/ mm <sup>3</sup>	CD4 increase ➤ 100/mm <sup>3</sup>	No increase
6 months	235	447	81.9%	69.3%	5.7%
12 months	268	276	87.3%	82.6%	4%
24 months	319	99	92%	93.3%	2%

# Total Adults Receiving ARV: Results at 12 and 24 Months

15 909 54 Months

	Background	Initial	Active	Deceased	Abandoned	Referral
12 months		1414	1106	96	173	41
%			78.2	6.8	12.2	2.9
24 months		1414	1038	114	212	53
%			73.4	8.1	15.0	3.7

# Children Receiving ARV: Results at 12 and 24 Months



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**Mutations found in  
Hospital Roosevelt: after the first  
failure with NNRTI schemes.**

32 Patients after the first failure  
of NVP- or EFV-based schemes

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# Resistance after failure of AZT-3TC-EFV or D4T/3TC/NVP in Guatemala

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- 32 patients with virologic failure
- Resistance
  - 3TC 68.8%: (22 patients)
  - NNRTIs 88.2% (37% K103N): (28 patients)
  - TAMs 53%, > 2 12.5%
  - Q151M: 9.4%
  - Ins 69: 6.2%
  - 48% with limited therapeutic options: reinforced IP + TDF + 3rd drug?

# Resistance Prevention

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- Epidemiologic surveillance.
  - Guarantee adherence:
    - Less pills
    - Friendly service
    - Trained staff
    - Adequate laboratory monitoring
    - Interaction management
    - Addiction management
    - Management of psychological and social aspects
-

# Resistance prevention by levels: Education and Accompaniment

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- I. Care Center level
  - II. Family accompaniment at the Care Center
  - III. Self-support groups at community level
  - IV. The same as III + health workers in the community and home.
    - Direct relationship with lower rates of abandonment according to intervention level.
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# Conclusions

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- ❑ The PAHO-WHO recommendations to initiate treatment may compromise the patient's life expectancy.
  - ❑ It is important to emphasize the need to access the **correct monitoring** of laboratory with viral load and CD4.
  - ❑ The exclusive clinical follow-up compromises the 2nd or 3rd line schemes, accumulating resistance mutations.
  - ❑ 3rd line treatments are urgently needed for the region.
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# New Challenges

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- Program sustainability:
    - Management, Funding, Distribution, Updated Protocols, etc.
  - Life expectancy versus reduction in mortality.
  - Preventive approach in chronic complications: coronary disease, diabetes, dyslipidemias, renal function, etc.
  - Development of new generations of care takers.
  - Challenge of treating handicapped people
  - If early detection is promoted, provide access to early treatment.
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# VIGILANCE PROJECTS

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- Mesoamerican study: INER México in coordination with PAHO.
  - Individual studies within the countries.
  - Regional Laboratory in Panama.
  - LARISNET: in process of being formed.
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# Websites for Consultation

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- ❑ [www.aidsinfo.nih.gov](http://www.aidsinfo.nih.gov)
- ❑ [www.paho.org](http://www.paho.org)
- ❑ [www.clinicalcareoptions.com](http://www.clinicalcareoptions.com)
- ❑ [www.hivinsite.com](http://www.hivinsite.com)
- ❑ [www.api.com](http://www.api.com)
- ❑ [www.cdc.com](http://www.cdc.com)

# THANK YOU

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PEPFAR-USAID-CDC-PAHO  
MAY, 2010