

**HIV CARE:  
HIGH RESOURCE VS. LOW  
RESOURCE REGIONS**

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**Johns Hopkins University**  
**SCHOOL OF MEDICINE**

# **HIV: LANDMARKS IN HISTORY**

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**1931: Probable first case**

**Primate → human (butchering)**

**1981: Disease discovery – AIDS**

**1983: HIV discovery**

**Luc Montagnier & R. Gallo**

**1985: Blood Test**

**Risks – blood and sex (HSV-2)**

**1986: AZT Trial**

**1996: Vancouver meeting HAART  
HAART**

# HIV NATURAL HISTORY

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**HIV transmission**

↓ **2- 4 weeks**

**Acute HIV (50 – 90 %)**

↓ **1- 3 weeks**

**Asymptomatic**

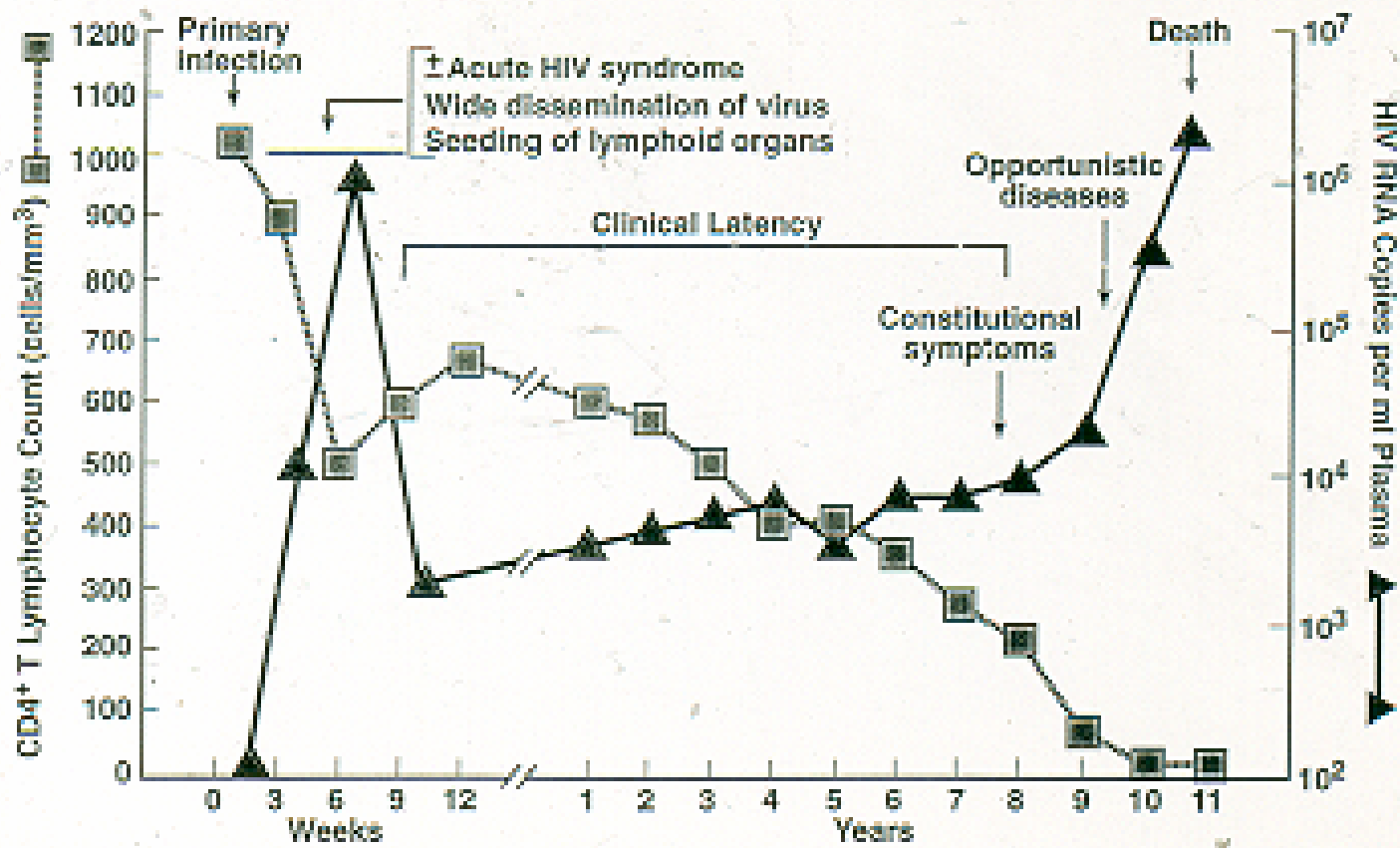
↓ **8 years**

**AIDS**

↓ **1.3 years**

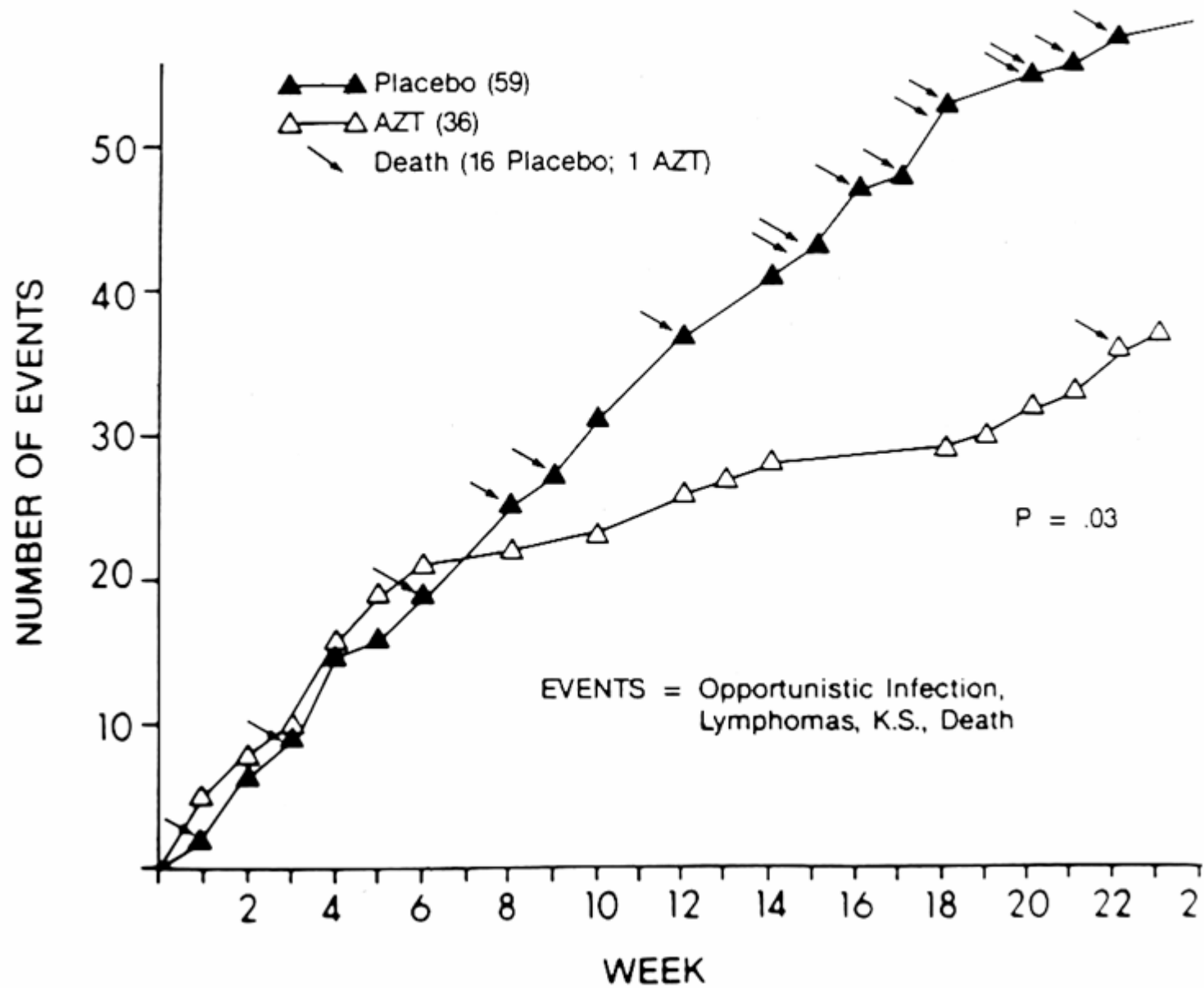
**Death**

# Typical Course of HIV Infection



Modified From: Fauci, A.S., et al, *Ann. Intern. Med.*, 124:654, 1996

### SERIOUS EVENTS / ALL PATIENTS



# **XI INTERNATIONAL CONFERENCE ON AIDS: VANCOUVER, JULY 7-16, 1996**

## **HIV viral dynamics**

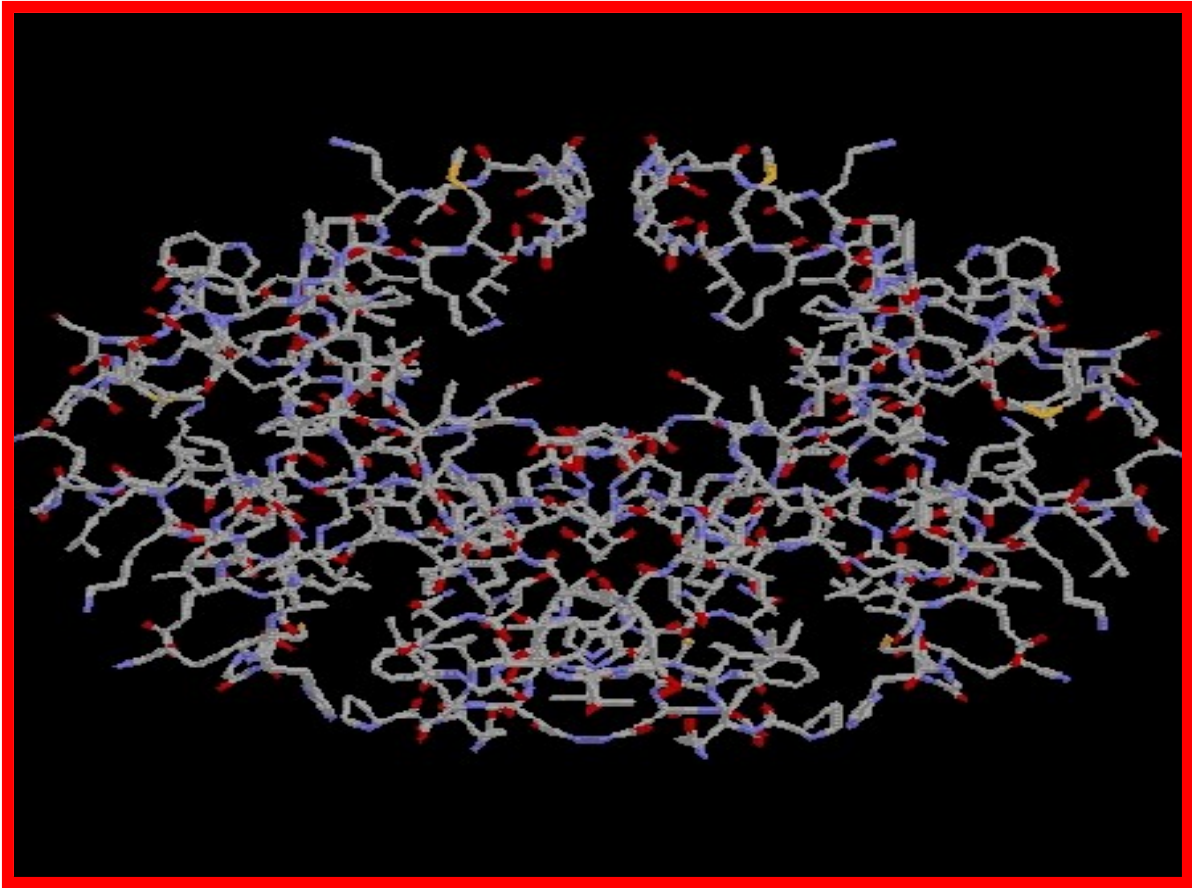
**D. Ho, G. Shaw: 10 billion/d**

## **HIV viral load**

- **J. Mellors: Predicts progression**
- **Roche: Threshold 15-25 c/mL**

## **Clinical trials**

- **J. Montagner: NVP/AZT/ddI**
- **R. Gulick: IDV/AZT/3TC**
- **M. Markowitz: SQV/RTV**



# SCIENCE

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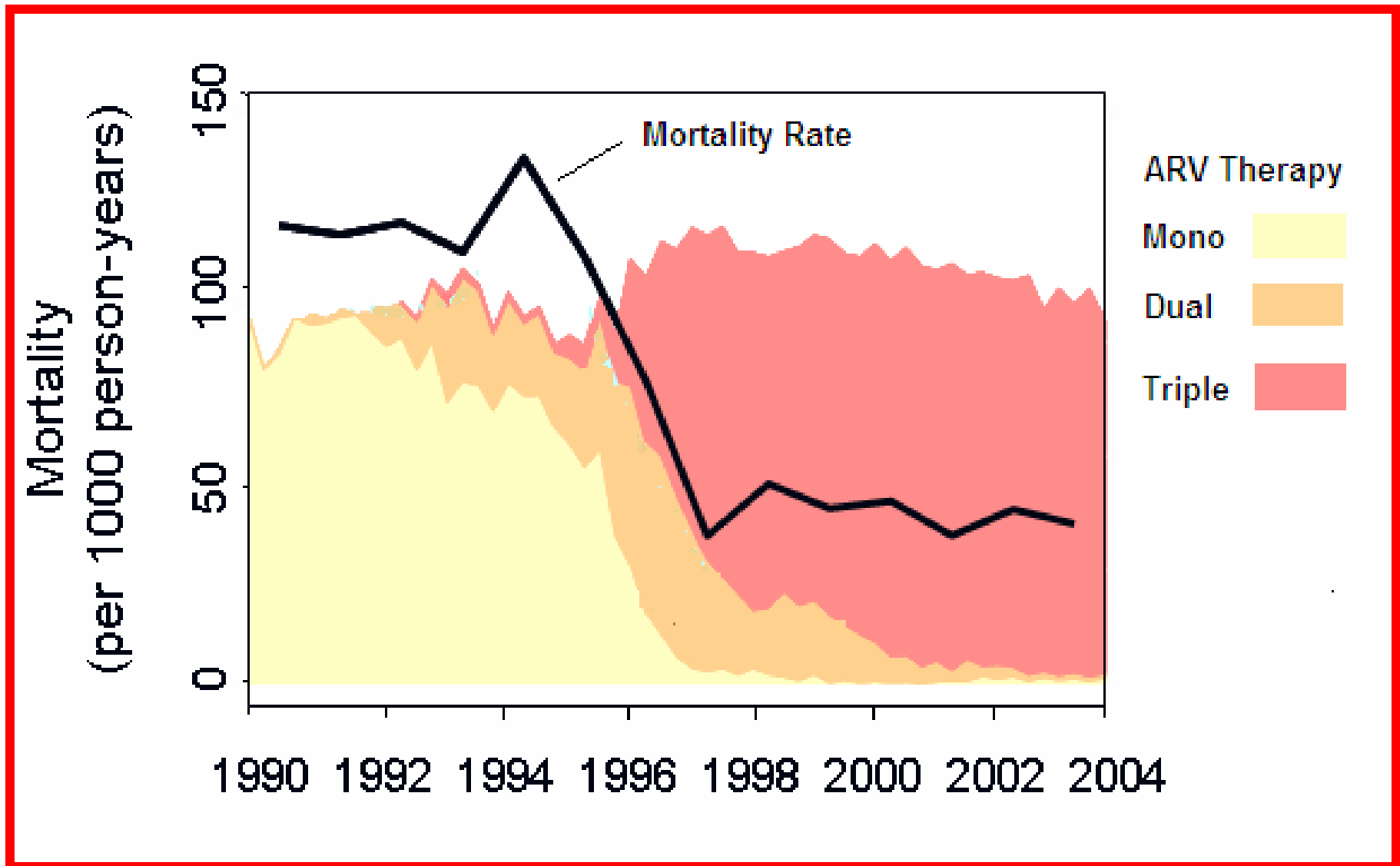
**NEW  
WEAPONS  
AGAINST**

**HIV**

**Breakthrough  
of the Year**

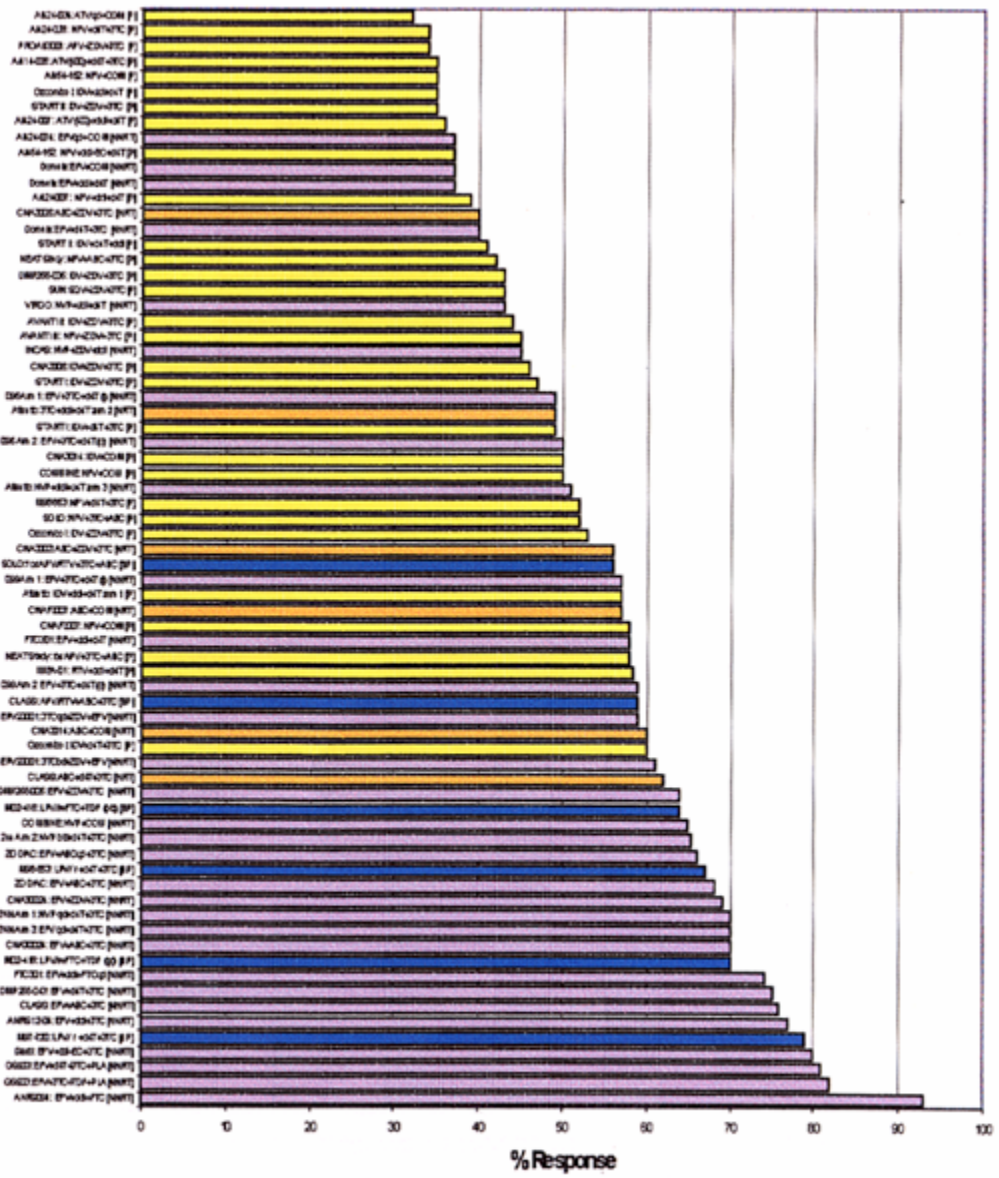


# Mortality From 1990-2004 in the Johns Hopkins HIV Clinical Cohort



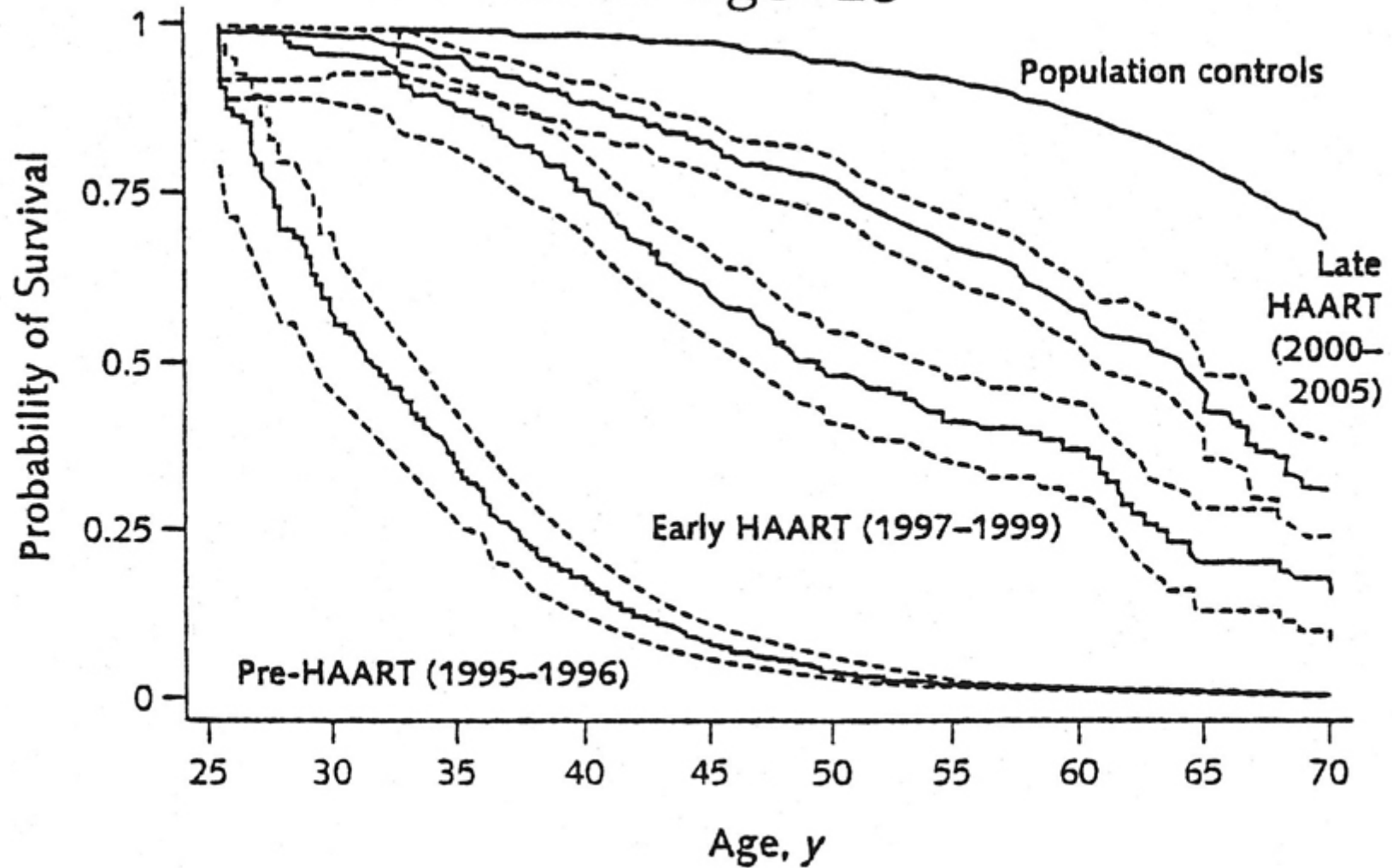
Lau B, et al. Non-AIDS Related Mortality Risk Exceeds AIDS-related Mortality Among Injecting Drug Users with CD4+ Counts Above 200 Cells/mm<sup>3</sup>. CROI Denver, CO, 2006

	<b>NRTI</b>	<b>NNRTI</b>	<b>PI</b>	<b>EL</b>	<b>CCR5</b>
<b>1987</b>	<b>AZT</b>	-----	---	---	-----
<b>1991-92</b>	<b>ddl,ddC</b>	-----	---	---	-----
<b>1995</b>	<b>d4T</b>	-----	---	---	-----
<b>1996</b>	<b>3TC</b>	-----	<b>SQV</b>	---	-----
<b>1997</b>	-----	<b>NVP</b>	<b>RTV, IDV</b>		
<b>1997</b>	-----	<b>DLV</b>	<b>NFV</b>	---	-----
<b>1998</b>	-----	<b>EFV</b>	---	---	-----
<b>1999</b>	<b>ABC</b>	-----	<b>APV</b>	---	-----
<b>2000</b>	-----	-----	<b>LPV</b>	---	-----
<b>2001</b>	<b>TDF</b>	-----	---	---	-----
<b>2003</b>	<b>FTC</b>	-----	<b>ATV, FPV</b>	---	-----
<b>2005</b>	-----	-----	<b>TPV</b>	<b>ENF</b>	
<b>2006</b>	-----	-----	<b>DRV</b>	---	-----
<b>2007</b>	-----	-----	---	---	<b>MVC</b>



BPI Triple
  NNRTI Triple
  NRTI Triple
  PI Triple

# Survival from age 25



Lohse Ann Int Med 2007;146:90

# US DHHS GUIDELINES

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## When to start

- **AIDS or CD4 < 200**
- **Consider: CD4 200-350**

## What to start

- **AZT/3TC, TDF/FTC or ABC/3TC**
- **EFV or PI/r**

## When to change

- **VL < 50 c/mL 6 mo.**
- **Toxicity**

## What to change to

- **Resistance**

# REALITIES OF TREATMENT

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- 1. Cannot cure HIV**
- 2. Viral control requires two active drugs – prefer 3**
- 3. Treatment is lifelong**
  - Expensive: \$12-20,000/yr**
  - short and long-term toxicity**

# **FUTURE OF HIV CARE IN US, EUROPE AND AUSTRALIA**

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- 1. Earlier treatment**
- 2. More drugs**
- 3. Test everyone 13-64 yrs**
- 4. Prevention**

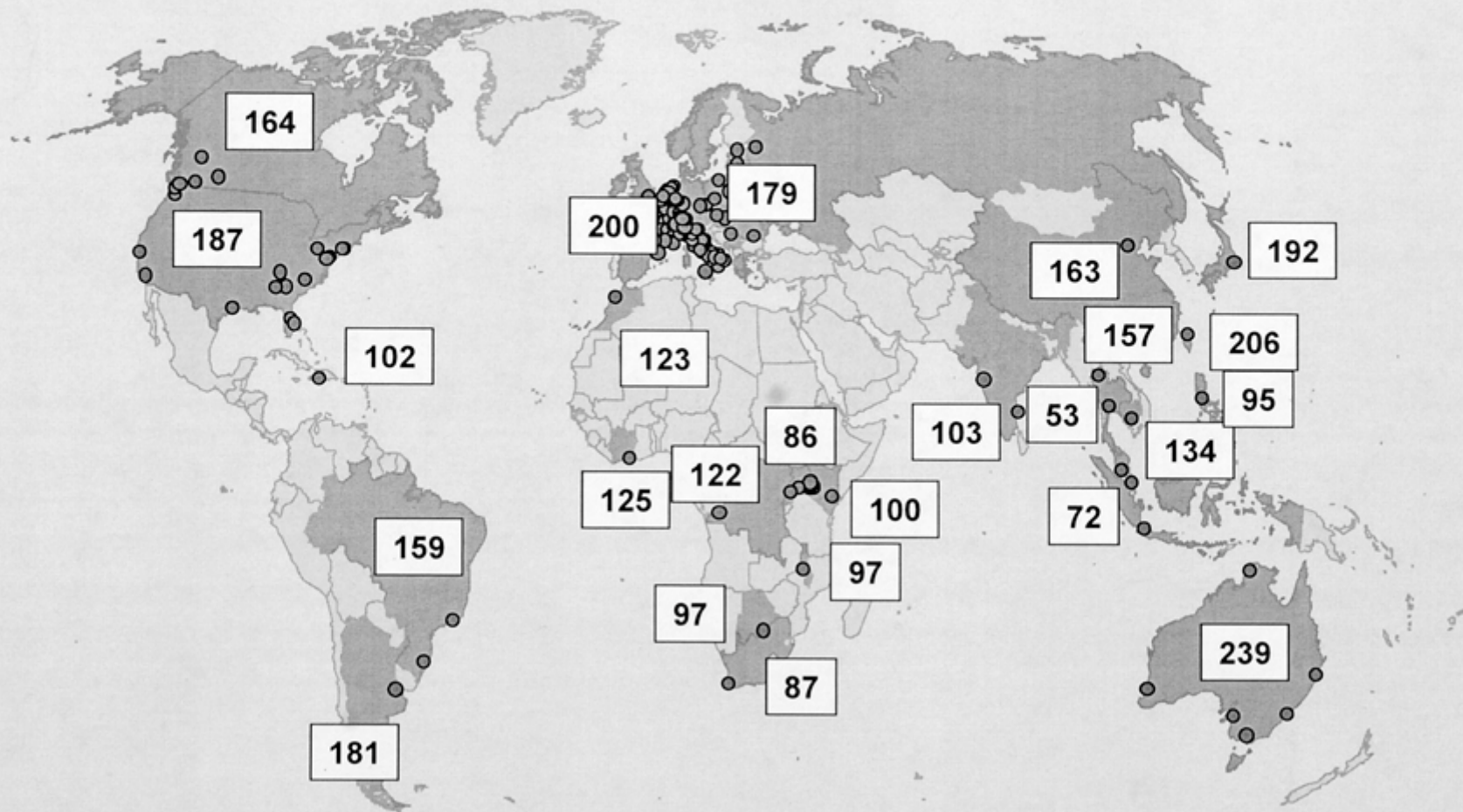
# START EARLIER

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- **Current experience – late starts everywhere**
- **Limited CD4 recovery**
- **Adherence demands are overstated**
- **Regimens are simplified, potent and less toxic**
- **Early Rx supported by large trials**
- **Resistance – stabilized, more classes, PI data**
- **Prevent transmission**
- **Non-AIDS –related complications – ca etc**

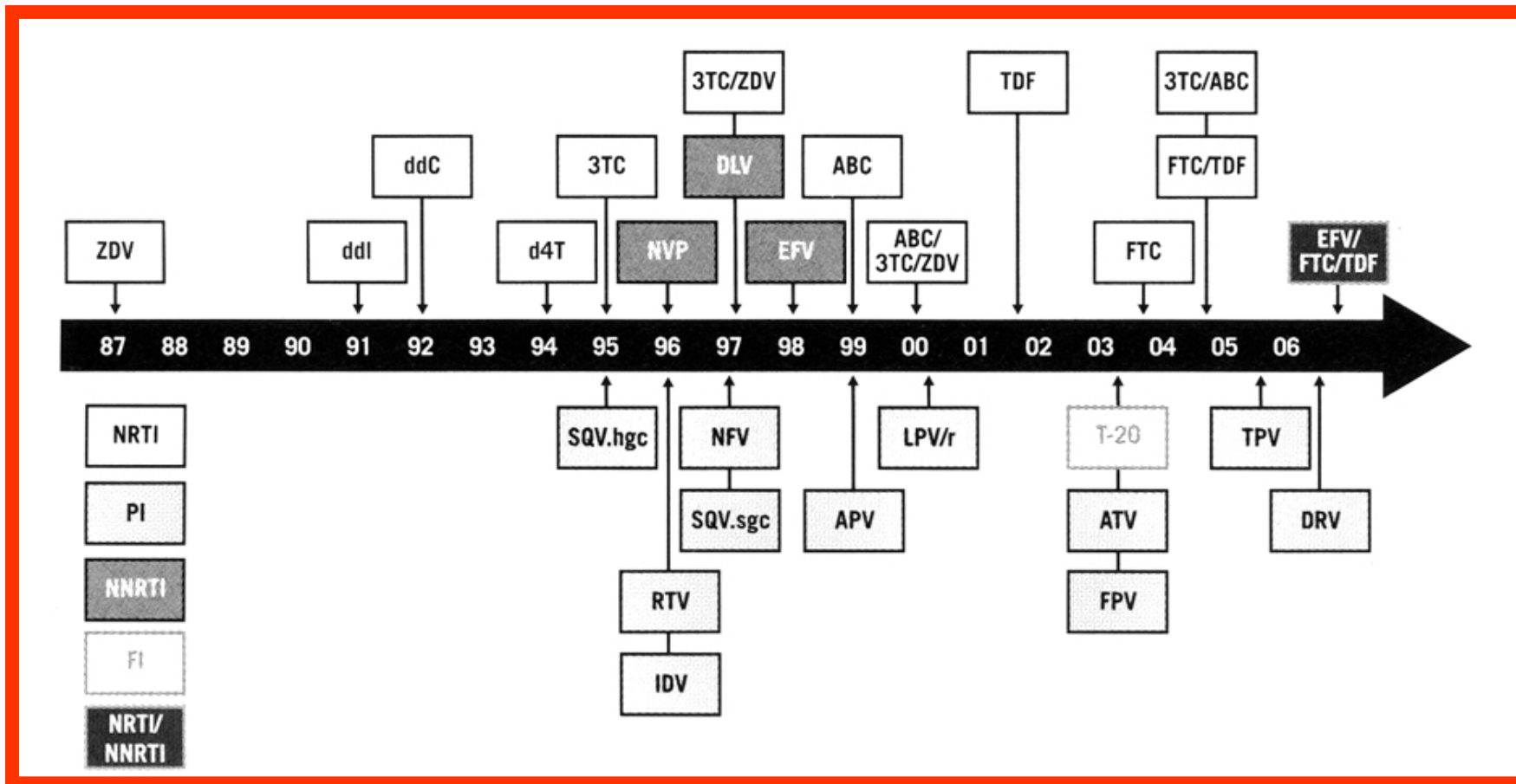
# CD4 count at start of ART, 2003-2005

42 countries, 176 sites, 33,008 patients



Numbers are median CD4 counts

# #3: NEW ANTIVIRALS



# HIV RISK OF MALIGNANCY: D:A:D

(Antonella. 14<sup>th</sup> CROI 2007; Abst #84)

**Method:** Analysis – 11 cohorts; 23,441 pts

<b>CD4</b>	<b>AIDS</b>	<b>cancers*</b>	<b>Non-AIDS</b>	<b>cancers</b>
	<b>Rate*</b>	<b>RR</b>	<b>Rate*</b>	<b>RR</b>
<b>&lt;50</b>	<b>20.1</b>	<b>175</b>	<b>6.0</b>	<b>15</b>
<b>50-99</b>	<b>4.8</b>	<b>41</b>	<b>9.6</b>	<b>19</b>
<b>100-199</b>	<b>2.8</b>	<b>24</b>	<b>6.8</b>	<b>10</b>
<b>200-349</b>	<b>0.7</b>	<b>6</b>	<b>2.0</b>	<b>3</b>
<b>350-499</b>	<b>0.3</b>	<b>3</b>	<b>1.0</b>	<b>2</b>
<b>&gt;500</b>	<b>0.1</b>	<b>1</b>	<b>0.6</b>	<b>1</b>

\*Rate/1000 patient-years

\*Lung – 62, GI – 41, hematologic -- 20

## **HIV PREVENTION**

**Number of cases in US stabilized at estimated 40,000/year 1990-2005, then increased to 45,000**

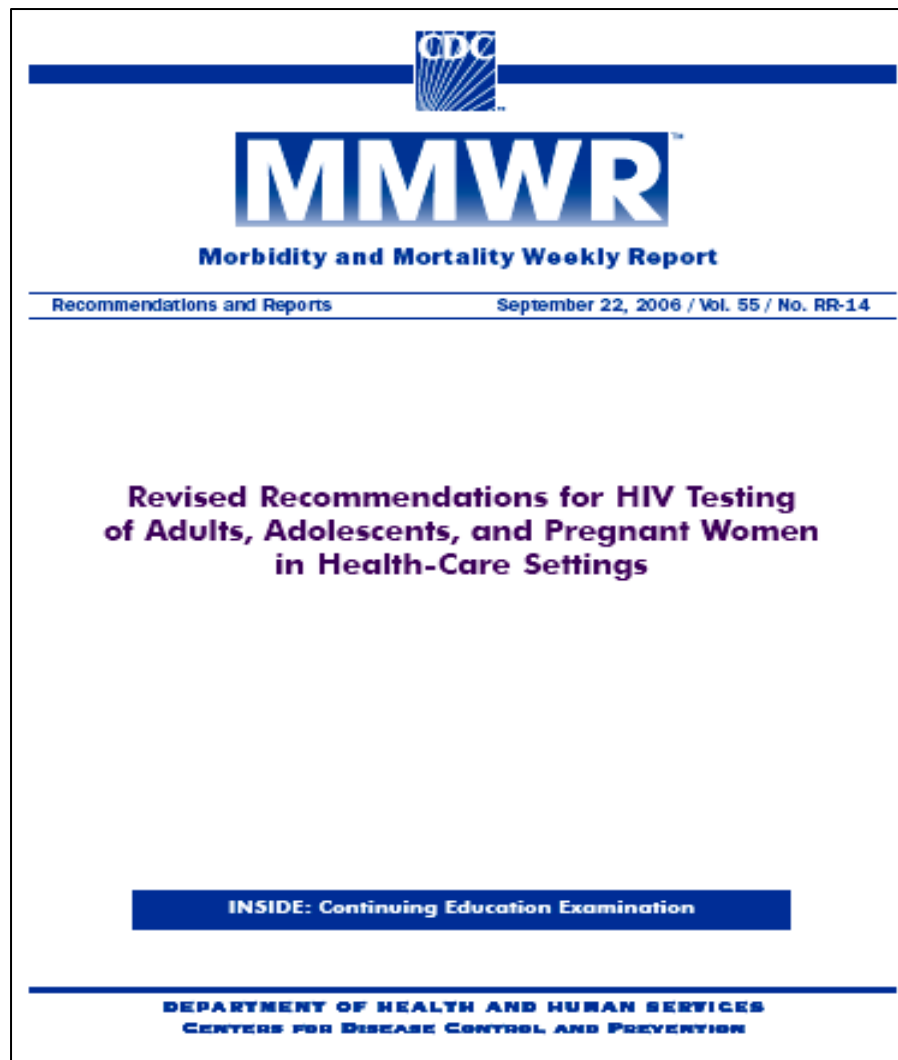
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**Number of cases in world has increased to 4.3 million in 2006**

# #6: Test all aged 13-64 yrs

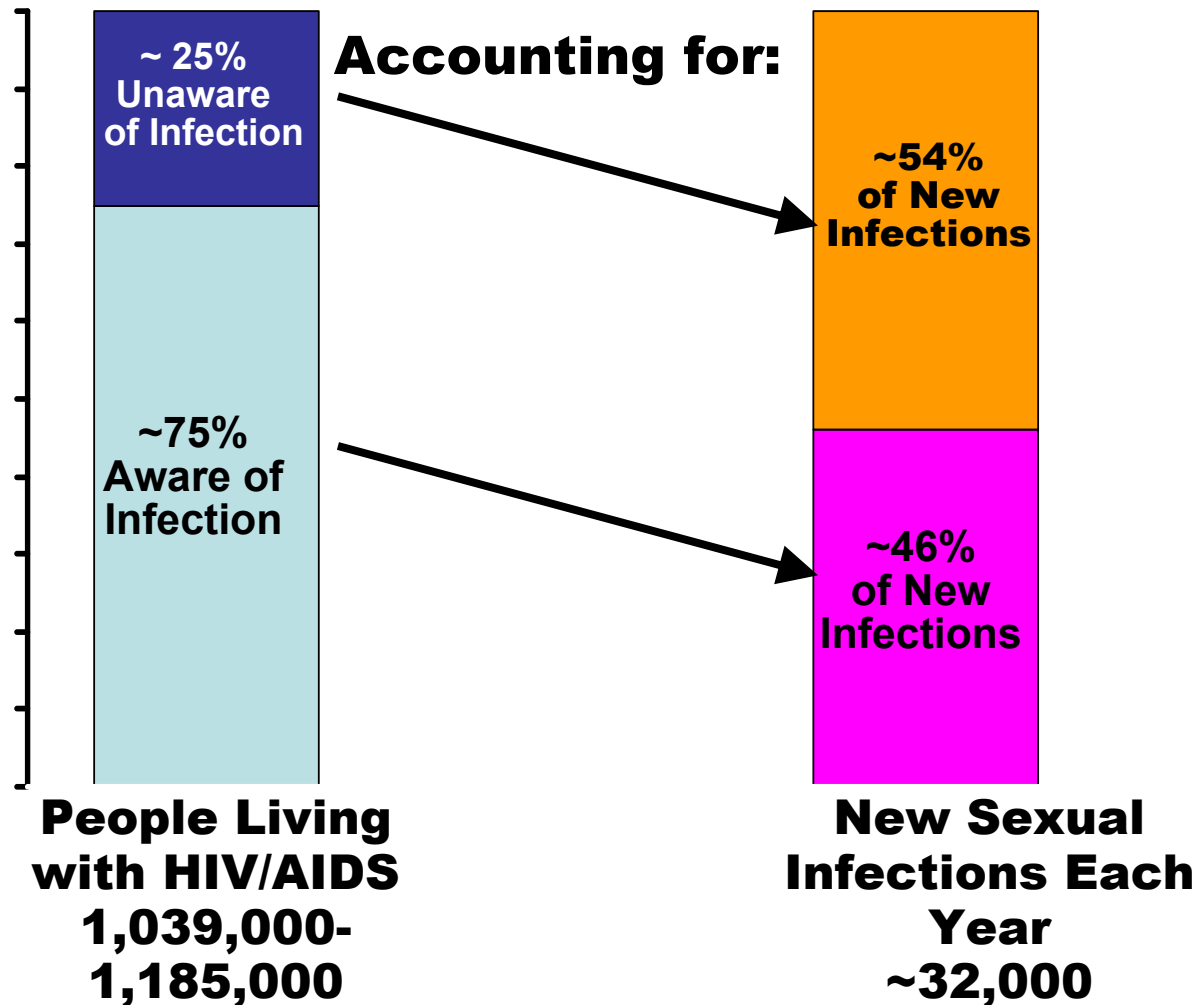
## September 22, 2006 CDC Recommendations

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- **Routine voluntary testing for patients ages 13-64 in health care settings – not based on patient risk**
- **Opt-out testing**
- **No separate consent for HIV**
- **Pre-test counseling not required**
- **Repeat HIV testing left to discretion of provider, based on patient risk**

# Awareness of Serostatus Among People with HIV and Estimates of Transmission



*Marks G, et al AIDS 2006; 20:1447-1450.*

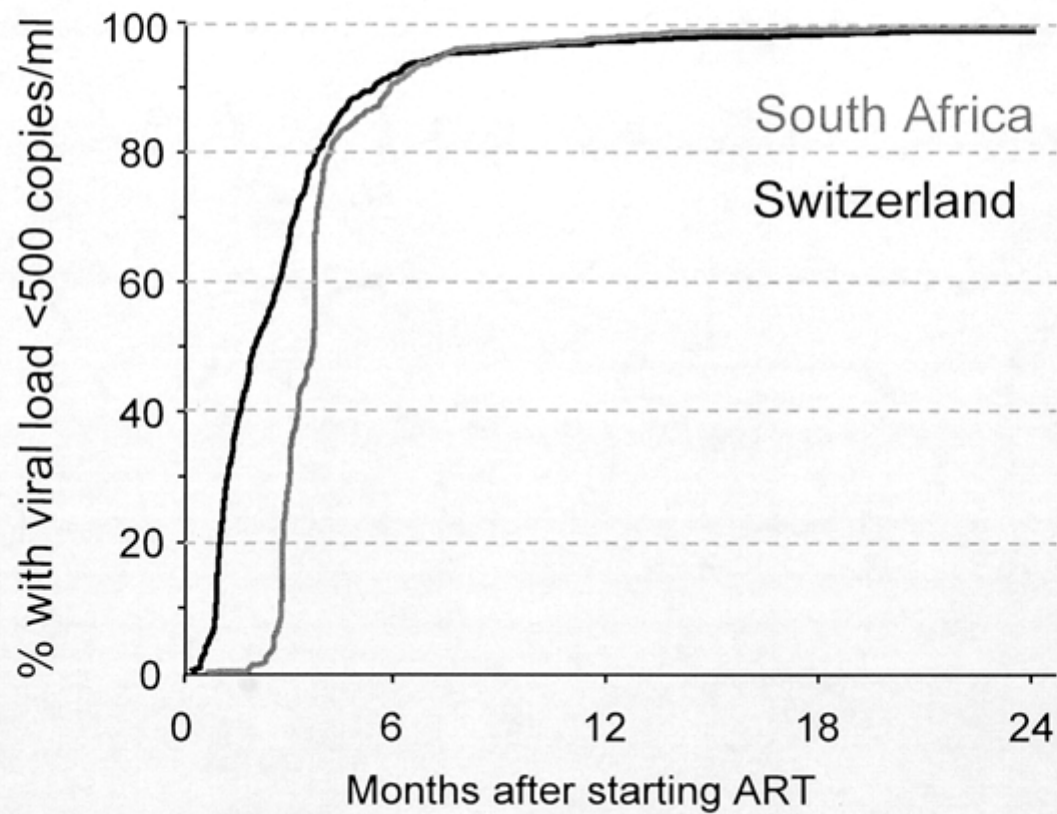
# **WORLD HIV/AIDS STATISTICS**

## **WHO, CDC: END OF 2006**

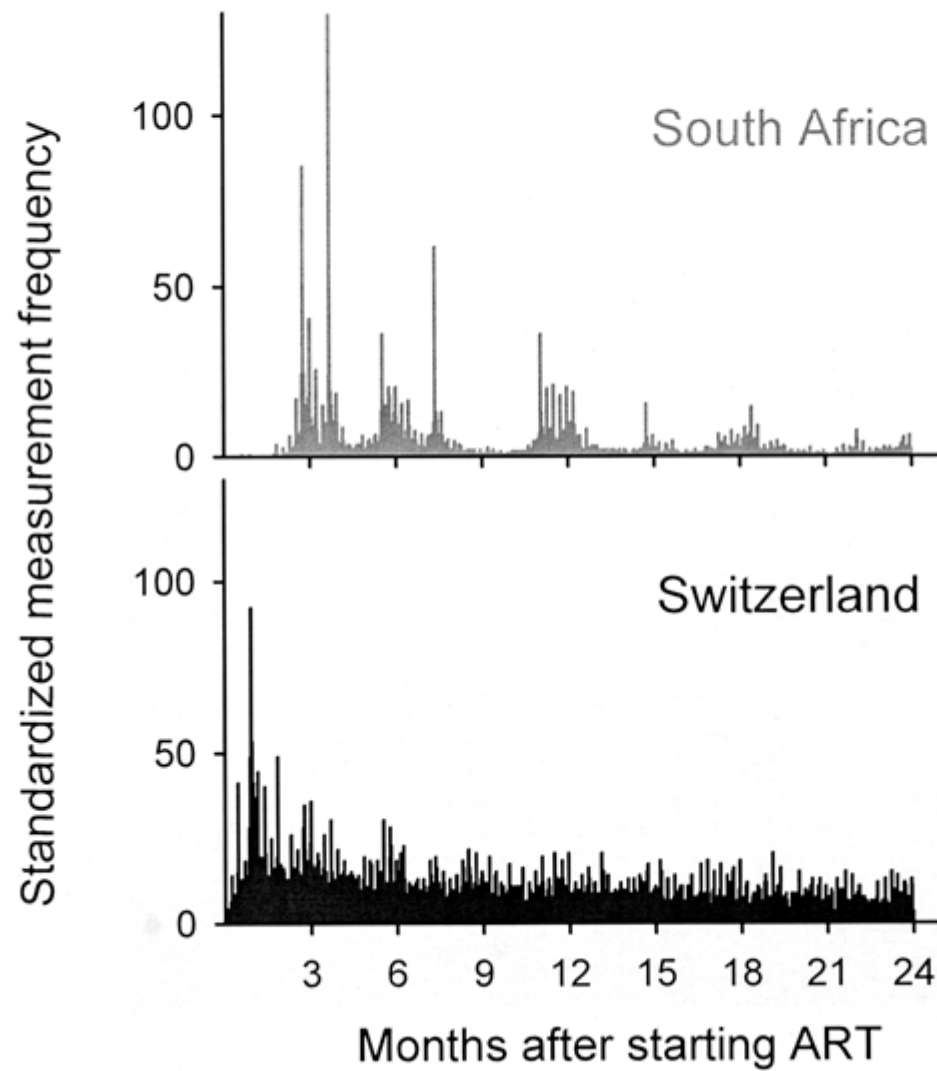
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<b>People living with HIV</b>	<b>39.2 mil</b>
<b>Newly infected 2006</b>	<b>4.3 mil</b>
<b>AIDS deaths</b>	<b>2.9 mil</b>
<b>No. receiving ART</b>	<b>2.2 mil</b>

# Initial virologic response ( $<500$ copies/ml)



# Frequency of viral load measurements



# MAJOR CONCERNS WITH WHO/PEPFAR PROGRAMS

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- **Resistance K103N**
- **Toxicity of NRTIs (d4T, ddl, AZT)**
- **Lack of second line agents**
- **Manpower/infrastructure**
- **Prevention**
- **Tuberculosis**