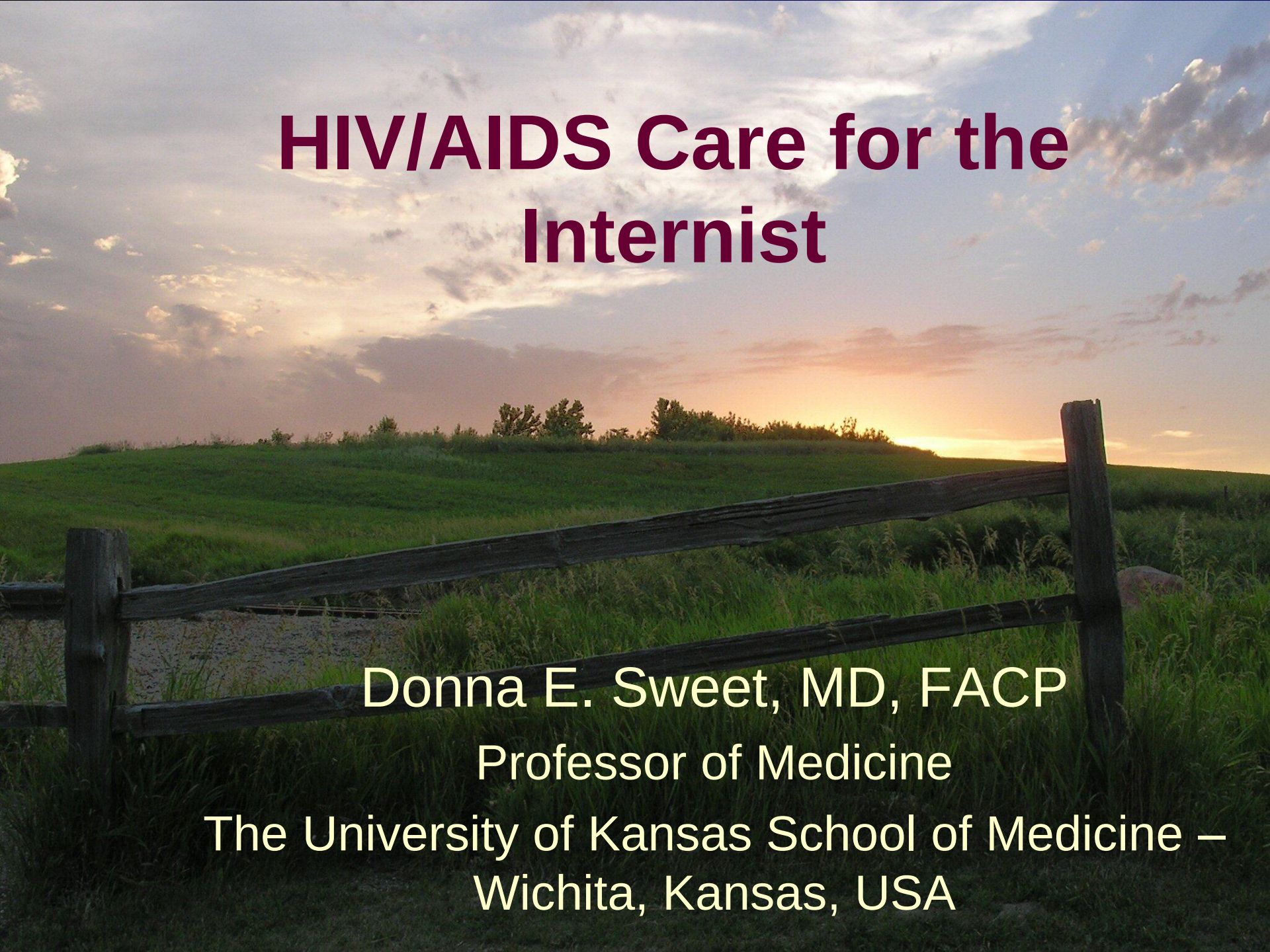

HIV/AIDS Care for the Internist

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What Should Everyone Know About HIV

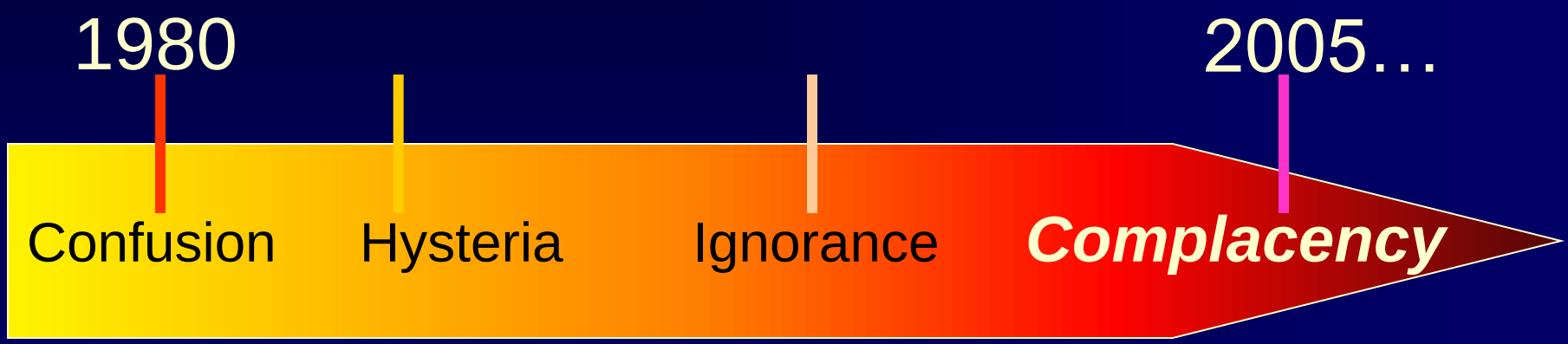
- Global / local status of HIV/AIDS
- Common modes of transmission
- Who should be tested
- Status of HIV in pregnancy
- How and when is HIV infection treated in 2005
- Importance of health maintenance for people living with HIV

Ten Things Health Care Providers Should Know About HIV/AIDS

- When to initiate antiretroviral therapy?
- What antiretroviral medications are available?
- What is a patient's prognosis?
- How important is health maintenance for people living with HIV?

AIDS

The Danger Continues…Just Different



HIV: Global Statistics

37.2 million Adults
2.2 million Children
Are living with HIV at the end of 2004

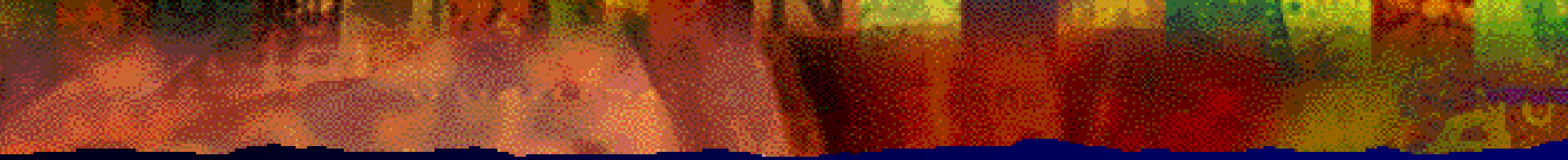
During that year, 4.9 million people became newly infected with the virus

Source: UNAIDS/WHO Epidemiological Fact Sheet – 2004 Update

HIV/AIDS in South Asia

- Over 7.4 million people in Asia are living with HIV/AIDS
  - This is nearly one fifth of the world's HIV infections
  - Almost two thirds of those infected are living in India
- High-risk behaviors and infection rates are growing in most South Asian countries
  - Injecting drugs with contaminated needles
  - Engaging in the selling and buying of sex
  - Size of these subpopulations in high risk behaviors is extensive, increasing the threat of rapid spread

Source: The World Bank, http://www.fxb.org/jul/theescalatingjul1_05.htm



Bangladesh

Approximately 13,000 adults and children were estimated to be living with HIV infection at the end of 2002

Only 363 HIV cases have been actually reported at the end of 2003

Source: UNAIDS/WHO Epidemiological Fact Sheet – 2004 Update

Bangladesh – 2004 Epidemiological Report

- Reported Cases - the end of 2003
  - 363 – HIV
  - 57 – AIDS
    - 31 had died

UNAIDS/WHO Epidemiological Fact Sheet – 2004 Update

Bangladesh: Prevalence Rates

- 0.1% - Adults age 15 – 49

- Specific Risk Groups are higher
  - 1.7% - Injecting drug users
  - 0.5% - Commercial sex workers

Source: A national behavioral and serological surveillance report
The World Bank in Bangladesh. http://www.worldbank.org/bd

Bangladesh has a narrow window of opportunity that has already closed for many other countries:

Prompt Action is Needed Now

to act early and decisively to prevent a nationwide HIV/AIDS epidemic while the number of HIV/AIDS cases in Bangladesh is still low.

Source: The World Bank, http://www.fxb.org/jul/theescalatingjul1_05.htm

Risk and Vulnerability

- A large commercial sex industry
- Consistent condom use is low
- Significant prevalence of sexually transmitted diseases
- Injecting drug users
- Lack of knowledge

Source: The World Bank, http://www.fxb.org/jul/theescalatingjul1_05.htm

This Epidemic is far from over---

Counsel all patients in your practice, young and old, about HIV prevention

What is HIV?

- HIV = Human immunodeficiency virus
- AIDS = Acquired immunodeficiency syndrome
- Destroys the immune system
- Immune system destruction leads to the complications associated with AIDS
- Targets CD4 T-lymphocytes (referred to as CD4 T cells or CD4 cells or T cells)

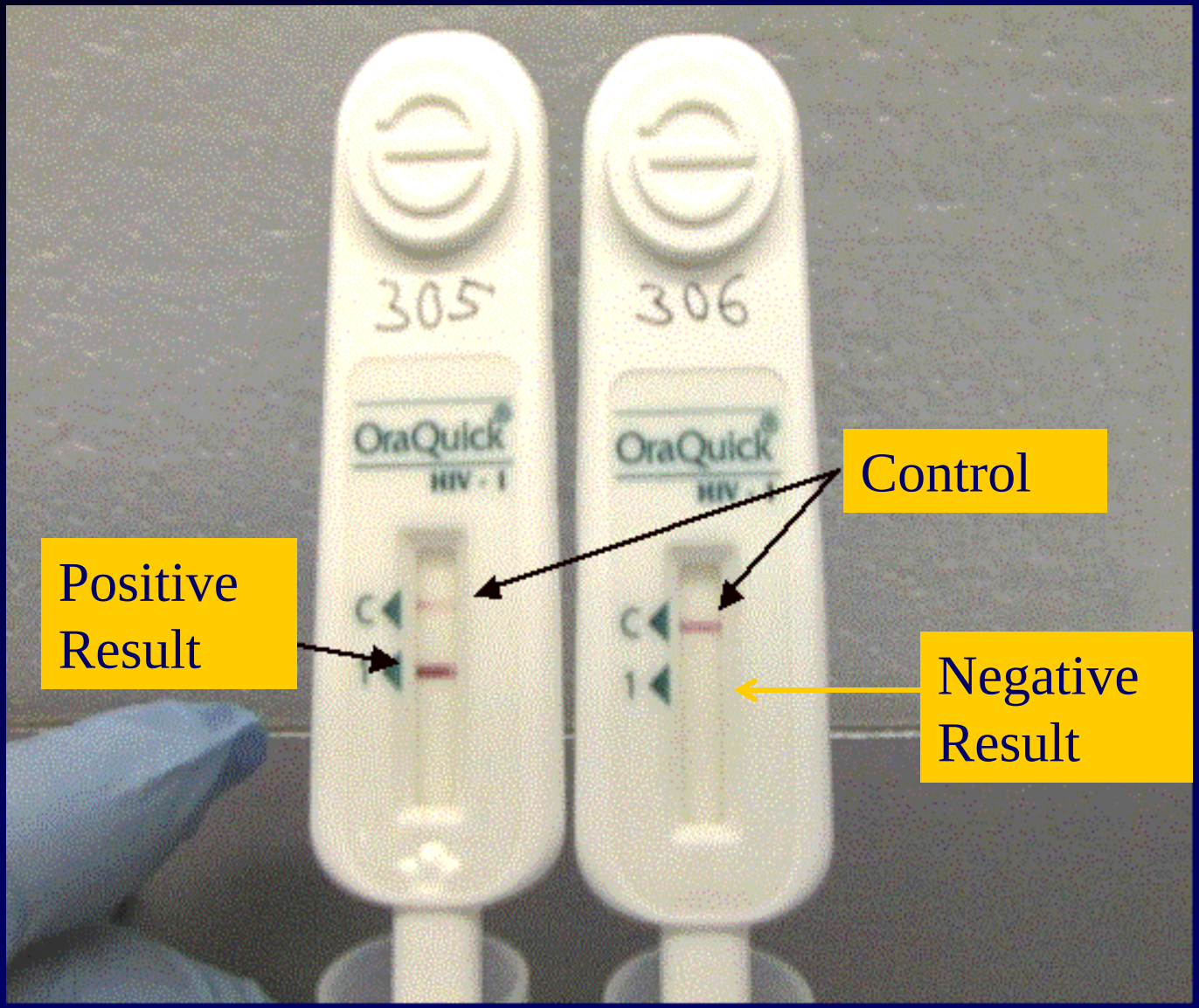
HIV Transmission

- Contact with infected body fluids (blood, semen, vaginal fluid, breast milk)
- Unprotected sex
- Sharing needles
- Mother to fetus

Make voluntary HIV testing a routine part of medical care

Rapid HIV Testing: OraQuick

- Finger stick sample
- 20 minutes to process
- Accurate results



Read Results in 20 Minutes!

Perinatal Transmission of HIV

16%–25% - mother to child transmission rate in North America and Europe without antiretroviral drugs during pregnancy

21% - 1994 in U.S. before the standard recommendations of zidovudine (ZDV) in pregnancy

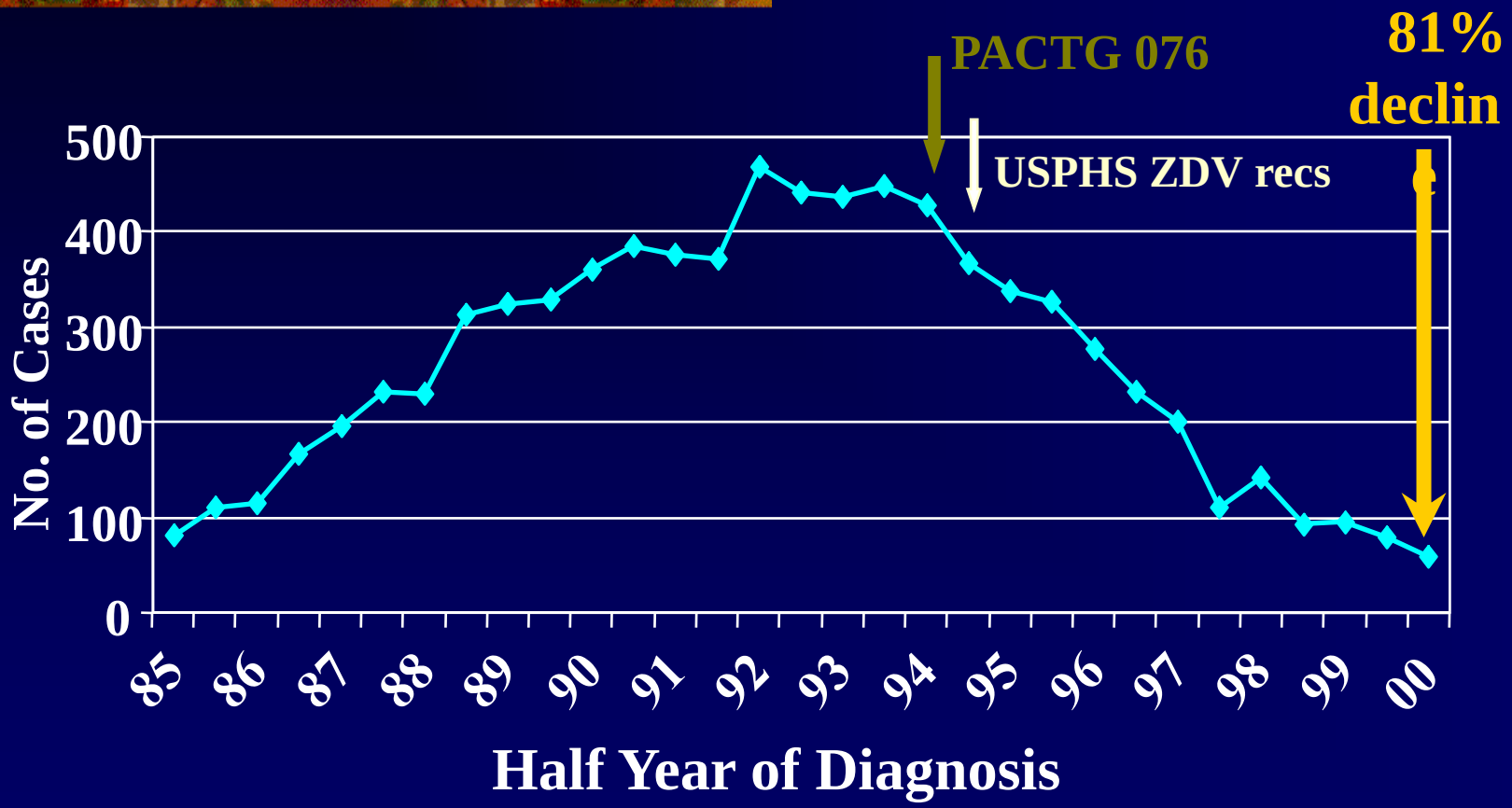
11% - 1995 U.S. rate after the change in practice

<2% - November 2004

Guidelines for ARV Drugs in Pregnancy: Concepts

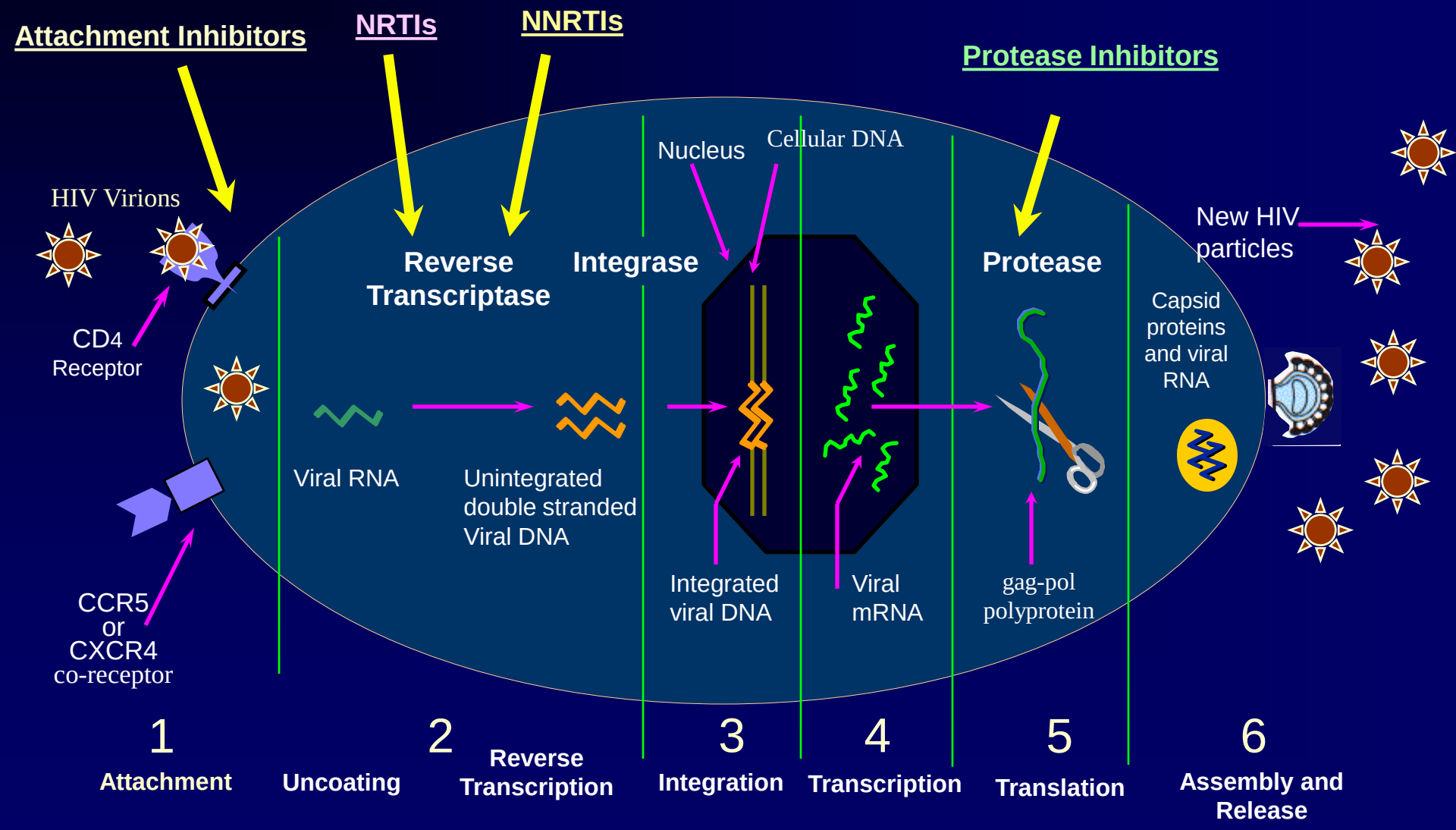
- Use optimal ARVs for the woman's health; consider the potential impact on the fetus/infant
- Offer 3-part ZDV regimen for reducing perinatal transmission alone or in combination with other ARVs
- Discuss preventable risk factors for perinatal transmission

Incidence of Perinatally-Acquired AIDS United States, 1985-June 2000*



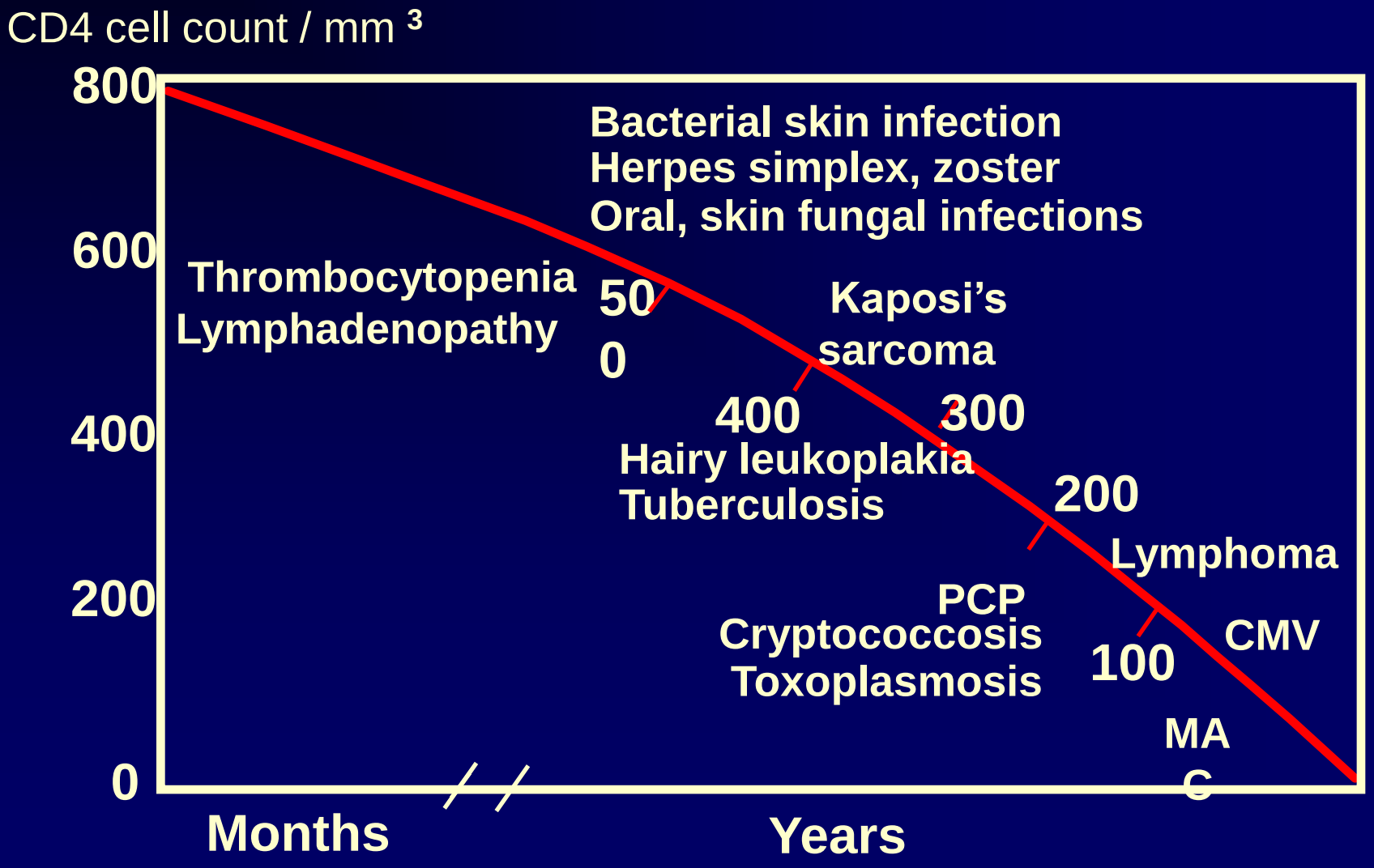
*Reported through December 2000

HIV Replication Cycle and Sites of Drug Activity



Adapted:Levy JA. HIV and the Pathogenesis of AIDS. 2nd ed. Washington, DC: American Society for Microbiology; 1998:9-11

Course of HIV Disease Progression as it Relates to CD4 Lymphocyte Count



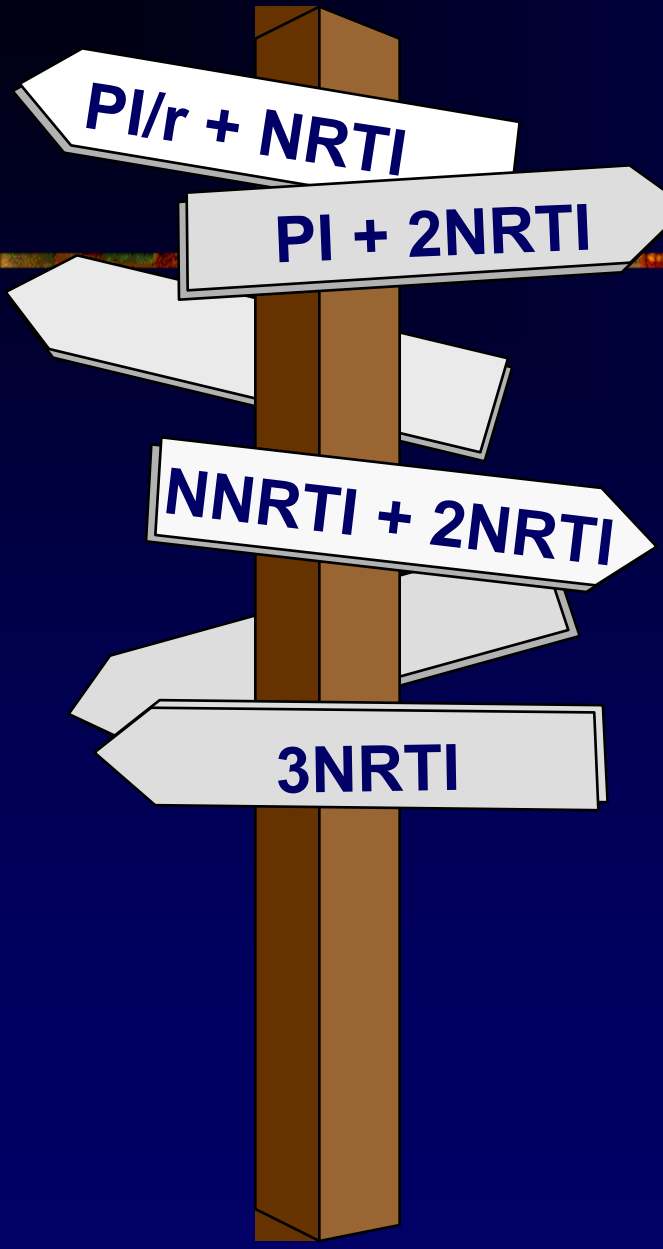
DHHS Guidelines: 4/7/2005

When to Start Treatment

Clinical Category	CD4+ Cell Count	Plasma HIV-1 RNA	General Guidelines
AIDS-defining illness or severe symptoms*	Any value	Any value	Treat
Asymptomatic	< 200	Any value	Treat
Asymptomatic	200-350	Any value	Treatment should be offered following full discussion of pros and cons of treatment.
Asymptomatic	> 350	≥ 100,000	Most clinicians recommend deferring therapy, but some clinicians will treat.
Asymptomatic	≥ 350	< 100,000	Defer therapy

Drugs Available for HIV Therapy

NRTI	NRTI	NNRTI	PI	FI
AZT	TDF	Efavirenz	Indinavir	T20
D4T		Delavirdine	Nelfinavir	
3TC		Nevirapine	Saquinavir	
ddI			Amprenavir	
ABC			Ritonavir	
ddC			Lopinavir/r	
FTC			Atazanavir	
			Fosamprenavir	
			Tipranavir	



The efficacy of different HAART regimens is similar.

How do we know which one to use?

Initial Treatment: Preferred Regimens

NNRTI-Based

	pills/day
▪ **Efavirenz*** **+ (lamivudine or emtricitabine)** **+ (zidovudine or tenofovir)**	2-5

PI-Based

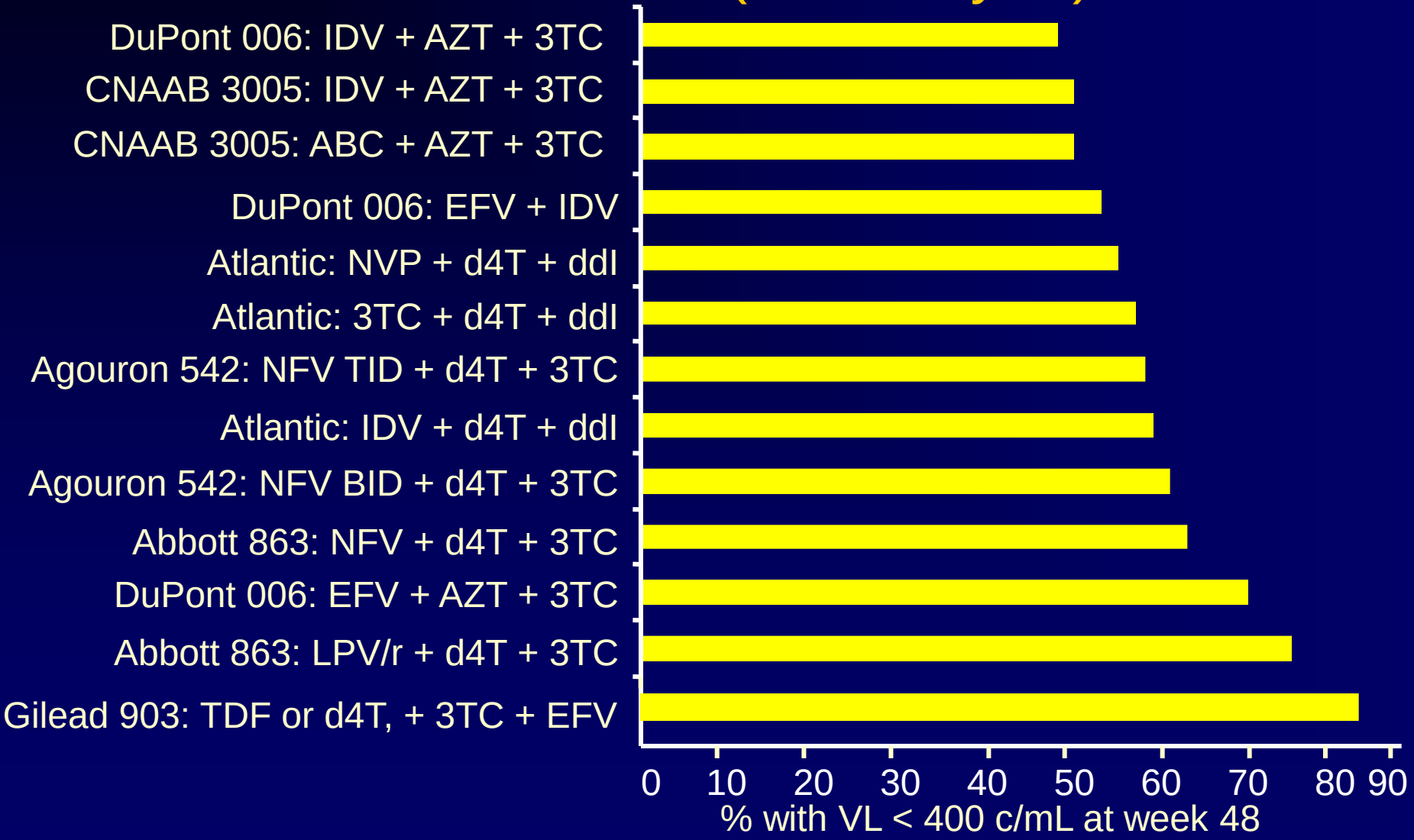
▪ **Lopinavir/ritonavir (Kaletra)** **+ (lamivudine or emtricitabine)** **+ zidovudine**	8-10

*Avoid in pregnant women and women with high pregnancy potential.

Comparison of Antiretroviral Trials

Randomized Trials, ≥ 100 pts/arm

VL <400 c/mL at Week 48 (ITT Analysis)

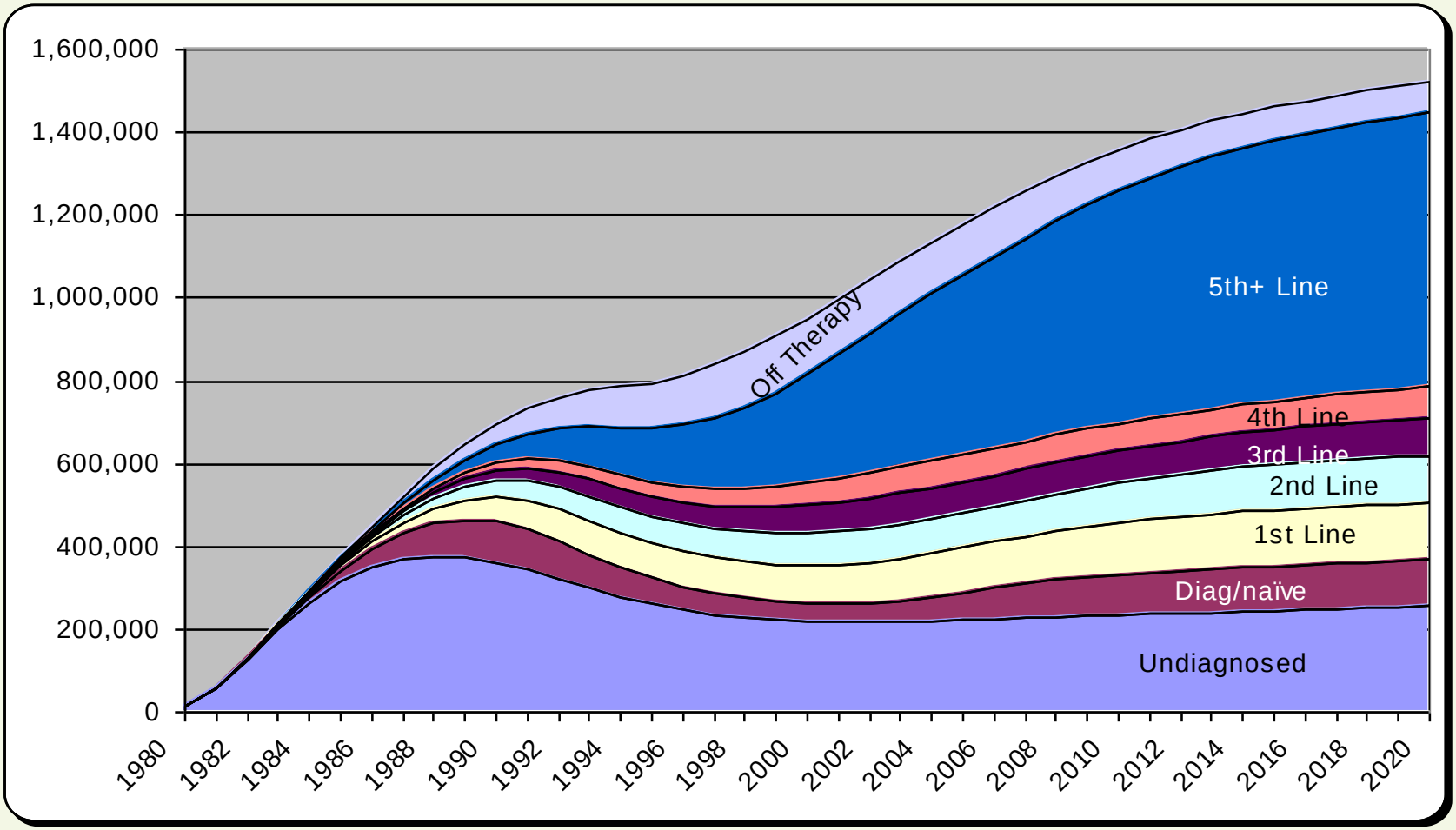


Adapted from: Bartlett JA, *AIDS* 2001;15:1369

Since All Regimens Have Comparable Efficacy, What Factors Determine Choice of Therapy?

- Durability
- Safety
- Tolerability
- Resistance Profile-
  ensuring future regimens will be successful
- Adherence
- Patient factors
  e.g. contraindications, drug interactions, lifestyle
- Economics

HIV Projected Patient Population (U.S.) 1980-2020



Note: A switch here is defined as any change to the regimen for any reason, i.e. not only due to virological failure

Encourage Healthy Lifestyle Choices

- Quit smoking
- Regular exercise
- Balanced diet with lots of nuts, fruits, and vegetables
- Stress reduction
- Quit / avoid all drug use - especially crystal methamphetamine
- Eliminate / avoid excess alcohol use

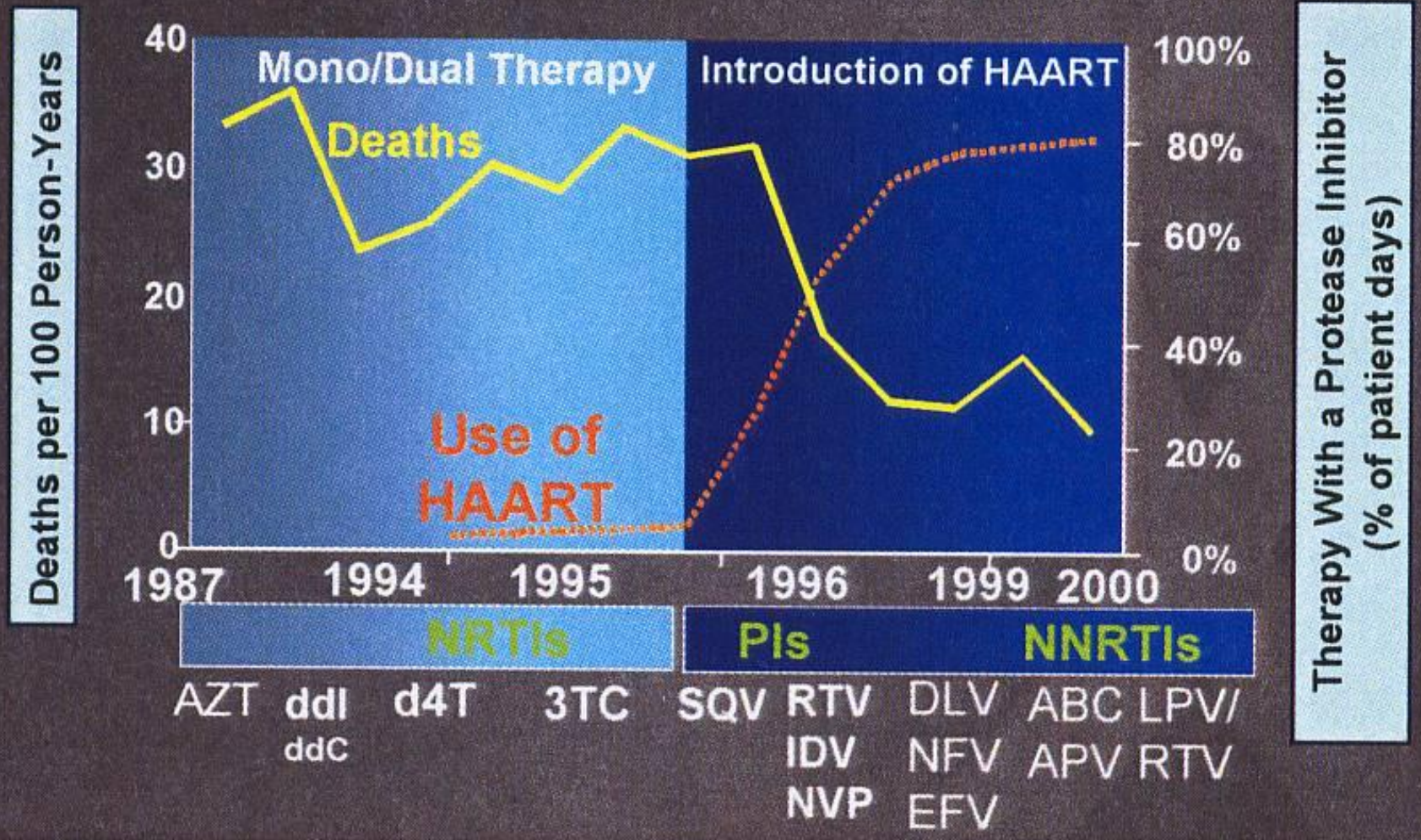
Major Toxicities

- Metabolic disorders
  - Lipodystrophy
  - Hyperlipidemia
  - Diabetes
- Renal tubular dysfunction (ADV)
- Anemia (ZDV)
- Kidney stones (IDV)
- Peripheral neuropathy (ddI, ddC, d4T)
- Pancreatitis (ddI)
- Rashes/Stevens-Johnson syndrome (NNRTIs)
- Hypersensitivity (ABC)
- Hepatotoxicity (RTV)

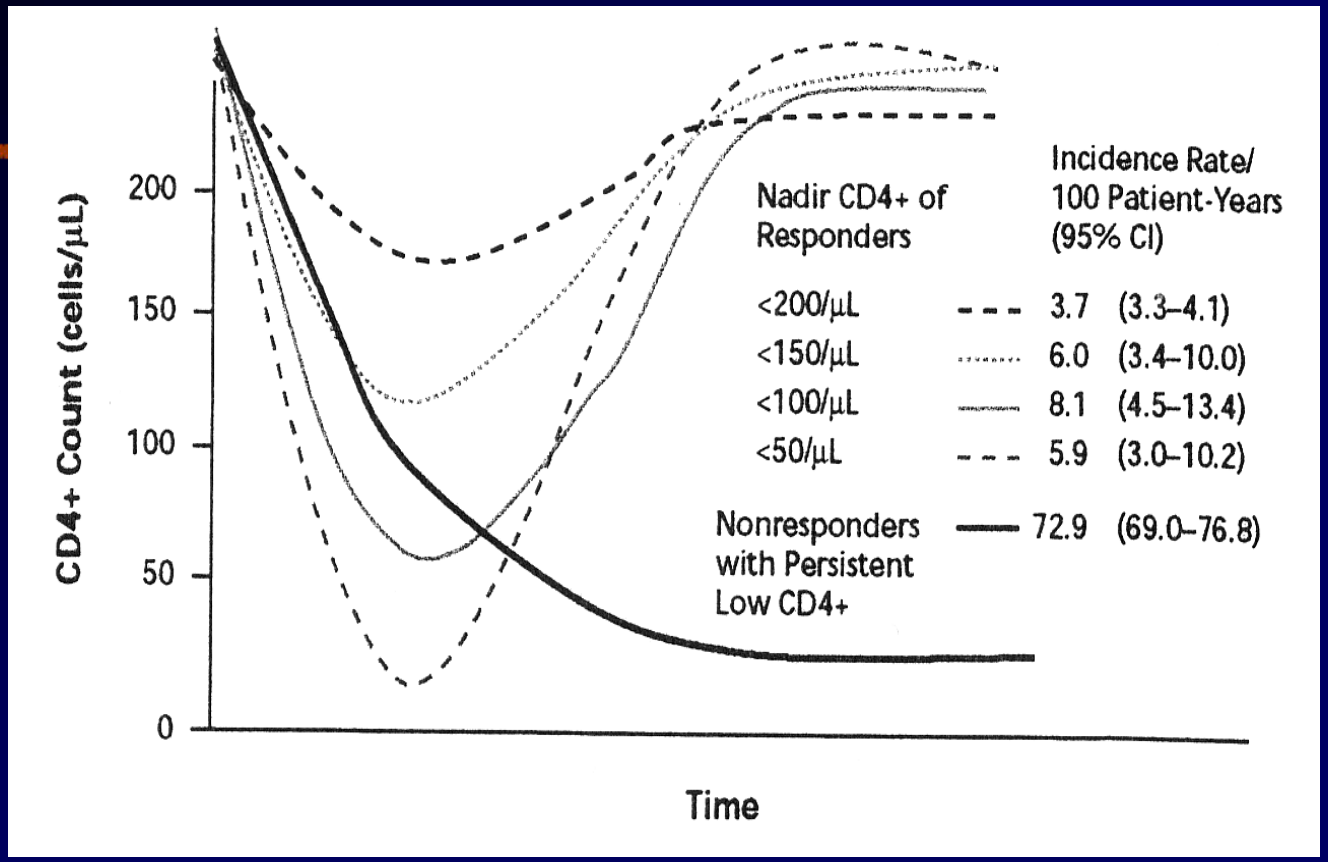
But It Works…

CHANGE OF HAART

DECLINE IN MORTALITY IN USA WITH USE OF PROTEASE INHIBITORS



Pretreatment Nadir CD4+ Cell Count Effect



On incidence of OI in patients whose CD4+ cell count increased to greater than 200uL on potent ART (responders) and incidence in patients with persistently low cell count (nonresponders).

Adapted with permission from Nukker et akm *Ann Intern Med*, 1999

Cost-Effectiveness Ratios for Common Medical Interventions

Treatment of	ICER*
Enalapril for congestive heart failure	$10,904
HIV antiretroviral therapy (CD4 ≥500 cells/mm^3)*	$13,000
HIV antiretroviral therapy (CD4 ≥500 cells/mm^3)‡	$17,300
HIV antiretroviral therapy (CD4 ≥500 cells/mm^3)†	$17,879
HIV antiretroviral therapy (CD4 <200 cells/mm^3)‡	$20,000
Lovastatin to prevent coronary disease	$23,607
Screening mammography, women 40-79 years	$33,724
Renal hemodialysis	$56,206
Prostate specific antigen screening, men 50 years	$127,026
Coronary artery bypass surgery, men 50 years	$127,026

***ICER = incremental cost-effectiveness ratio**

*Freedberg KA, et al. NEJM, 2001; 344:824-831.

†Kauf T, et al. 1st IAS, 2001: Abst. 286.

‡Schackman BR, et al. Am J Pub Health, 2001; 91:1456-1463.

Moore RD, et al. PharmacoEconomics 1996;10:109-13.

HAART Reduces Expenditures

- In the USA, a study found that widespread use of HAART, despite its high cost, has been independently associated with a reduction in overall expenditures for HIV care
- The main reason is that the use of HAART has kept patients out of the hospital
- The estimated annual expenditures (adjusted for interview date, clinical status, and deaths) for HIV care declined about 10% from $20,300 per patient in 1996 to $18,300 in 1998

Twenty Years of Progress

- **HIV/AIDS is one of the most formidable scientific challenges ever confronted**
- **In just two decades, remarkable advances have been made in the fight against AIDS**

1985:

✓0 drugs

✓Little known about HIV mechanism of action

✓Little support for HIV patients who need access to treatment

✓16,000 U.S. AIDS cases reported;20,000 globally

2005:

✓24 therapies, 4 drug classes

✓Major advances in knowledge about viral life-cycle, processes

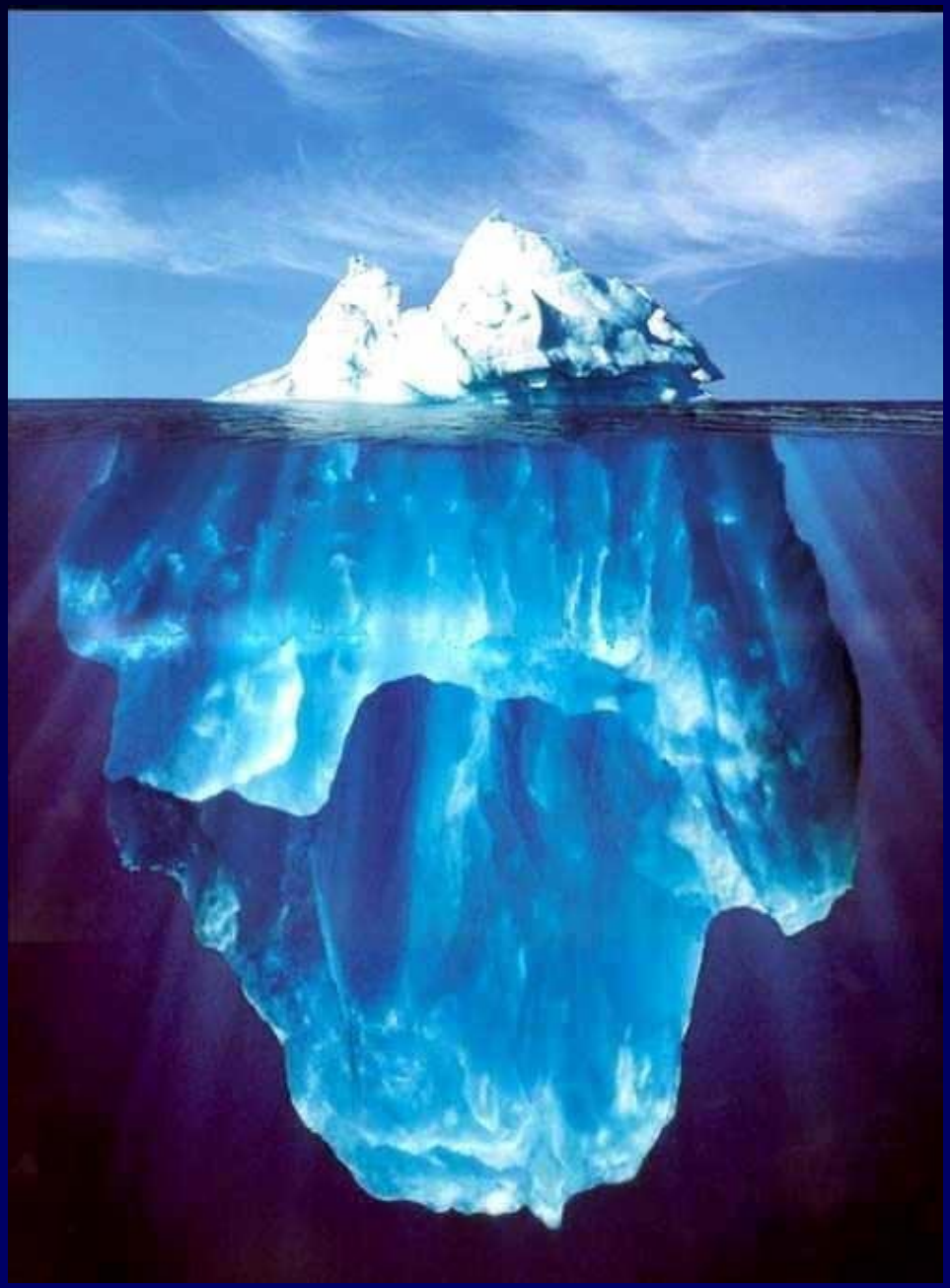
✓Network of federal and local programs

✓950,000 people with HIV in U.S. 38 million worldwide

Issues and Challenges: Priority Areas

- Scaling up the behavioral change activities and health promotion
- Expanding advocacy and awareness efforts for the population at large
- Promoting the social acceptability of condom use
- Reducing discrimination
- Strengthening Government of Bangladesh capacity
- Promoting NGO capacity
- Strengthening mechanisms for collaboration and coordination

The Tip Of The Iceberg---



Just as photographic technology has increased to allow us to see the entire iceberg, the same is true with HIV--- we know more ---

but the hazard remains