

Thirty Years of HIV/AIDS: A Personal Journey

Anthony S. Fauci, M.D.

Director

**National Institute of Allergy and Infectious
Diseases**

National Institutes of Health

September 22, 2011



The New York Hospital – Cornell Medical Center



**Cornell Medical School –
1962-1966**



**Department of
Medicine House
Staff – 1966**

National Institutes of Health, Bethesda, MD

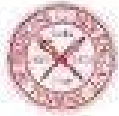


National Institute of Allergy and Infectious Diseases





**The New York Hospital – Cornell Medical Center
Department of Medicine House Staff
1971-1972**



The
New England
Journal of Medicine

Established in 1812 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY
VOLUME 285 December 31, 1978 NUMBER 27

**Effect of
Cyclophosphamide
Upon the Immune
Response in
Wegener's
Granulomatosis**

AS Fauci, SM Wolff &
JS Johnson

November 1978

Volume 285

Number 27

Annals of Internal Medicine

Published Twice Monthly by the American College of Physicians

**The Spectrum of
Vasculitis: Clinical,
Pathologic,
Immunologic and
Therapeutic
Considerations**

AS Fauci, B Haynes & P Katz

CENTERS FOR DISEASE CONTROL

MNWR[™]

MORBIDITY AND MORTALITY WEEKLY REPORT

June 5, 1981

***Pneumocystis Pneumonia -
Los Angeles***

July 4, 1981

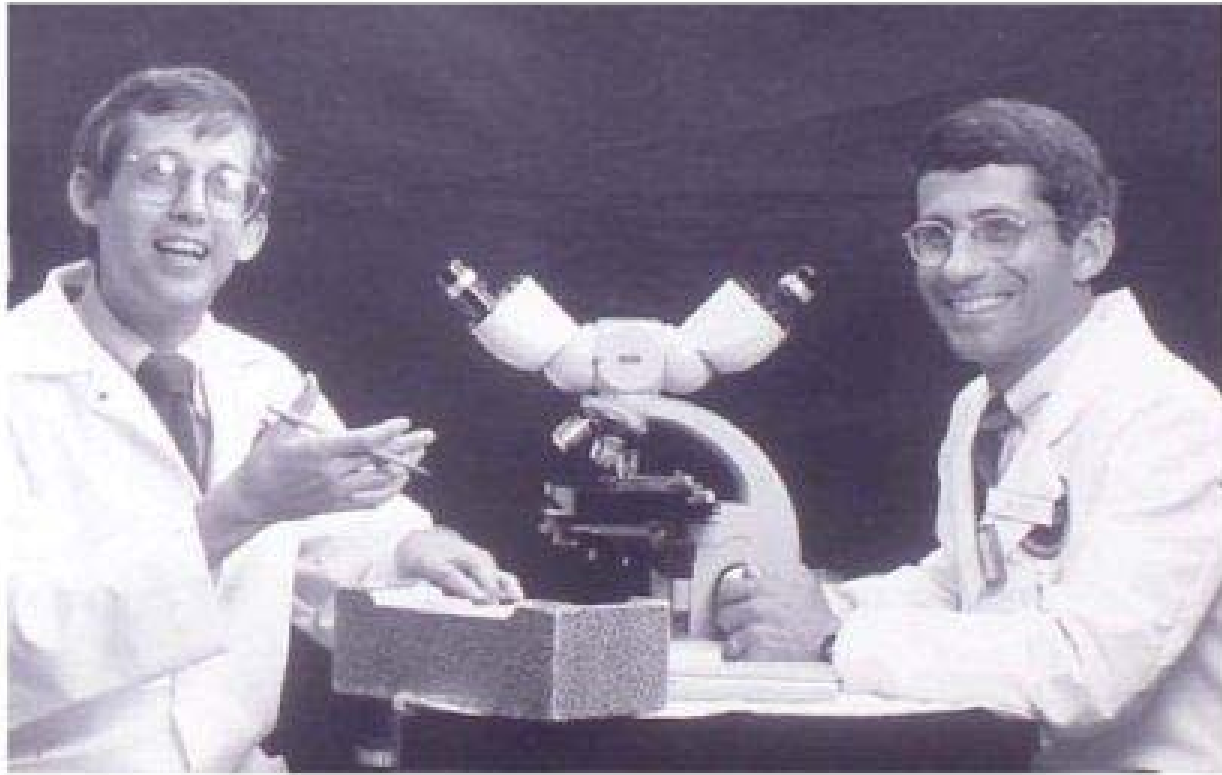
***Kaposi's Sarcoma and
Pneumocystis Pneumonia Among
Homosexual Men -
New York City and California***

NIAID Laboratory of Immunoregulation, 1981



NIAID Laboratory of Immunoregulation, 1981





1 June 1982

Volume 96

Number 6

Annals of Internal Medicine

Published Twice Monthly by the American College of Physicians

The Syndrome of Kaposi's Sarcoma and Opportunistic Infections: An Epidemiologically Restricted Disorder of Immunoregulation

Anthony S. Fauci, M.D.

"...because we do not know the cause of this syndrome, any assumption that the syndrome will remain restricted to a particular segment of our society is truly an assumption without scientific basis."

CENTERS FOR DISEASE CONTROL

MMWRTM

MORBIDITY AND MORTALITY WEEKLY REPORT

July 09, 1982

Opportunistic Infections and Kaposi's Sarcoma among Haitians in the United States

July 16, 1982

Pneumocystis carinii Pneumonia among Persons with Hemophilia A

December 10, 1982

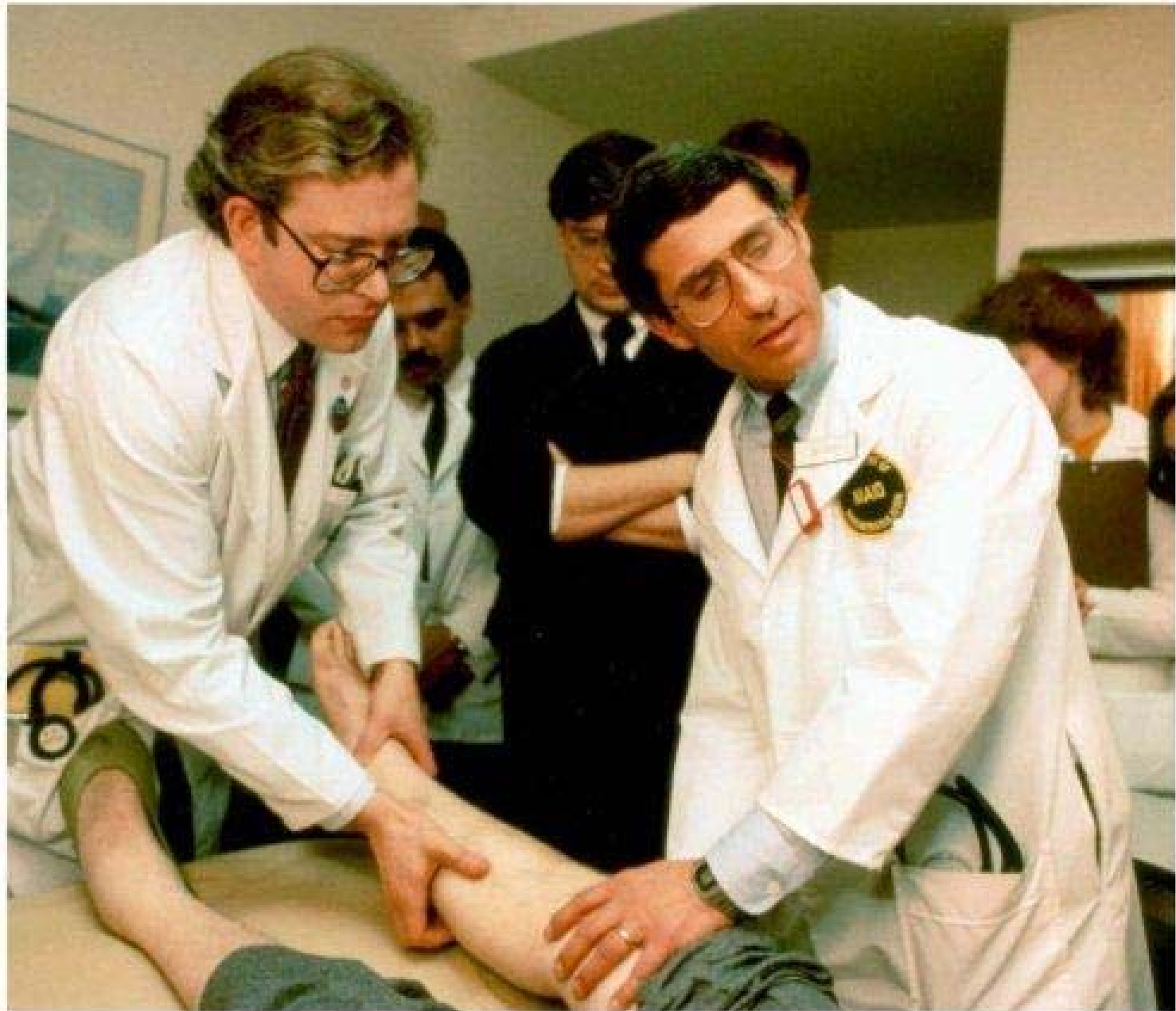
Possible Transfusion-Associated Acquired Immune Deficiency Syndrome (AIDS) -- California

December 17, 1982

Unexplained Immunodeficiency and Opportunistic Infections in Infants -- New York, New Jersey, California

January 07, 1983

Immunodeficiency among Female Sexual Partners of Males with Acquired Immune Deficiency Syndrome (AIDS) -- New York





The
**New England
Journal of Medicine**

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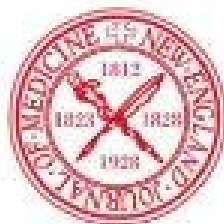
VOLUME 309

August 25, 1983

NUMBER 8

**Abnormalities of B-cell Activation and
Immunoregulation in Patients with the
Acquired Immunodeficiency Syndrome**

HC Lane, H Masur, LC Edgar, G Whalen, AH Rook,
and AS Fauci



The
**New England
Journal of Medicine**

Established in 1812 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

VOLUME 313

July 11, 1985

NUMBER 2

**Qualitative Analysis of Immune Function
in Patients with the Acquired
Immunodeficiency Syndrome**

Evidence for a Selective Defect in Soluble Antigen Recognition

HC Lane, JM Depper, WC Greene, G Whalen,
TA Waldmann, and AS Fauci

The NIH Record

U.S. Department
of Health
and
Human Services

November 20
1984
Vol. XXXVI
No. 24

National
Institutes
of
Health

Dr. Anthony Fauci, Expert on Immunity and AIDS, Named Director of Nat'l. Institute of Allergy and Infectious Diseases

Dr. Anthony S. Fauci has been named Director of the National Institute of Allergy and Infectious Diseases, effective Nov. 2.

NIAID conducts and supports research to better understand the causes of allergic, immunologic and infectious diseases, and to develop better means of preventing, diagnosing and treating such illnesses.

Dr. Fauci, 43, an internationally renowned expert on the immune system, has been chief of NIAID's Laboratory of Immunoregulation since 1980 and deputy clinical director of the Institute since 1977.

"I am extremely pleased that Dr. Fauci will take over the leadership of this important institute," HHS Secretary Margaret M. Heckler said in announcing the appointment. "His unique background, particularly in the fields of immunology and infectious diseases, will be of key importance in maintaining and accelerating our momentum in these crucial



Dr. Fauci is internationally renowned for his expertise on the immune system.

Testimony Before the House Appropriations Subcommittee for the NIAID Budget March, 1987



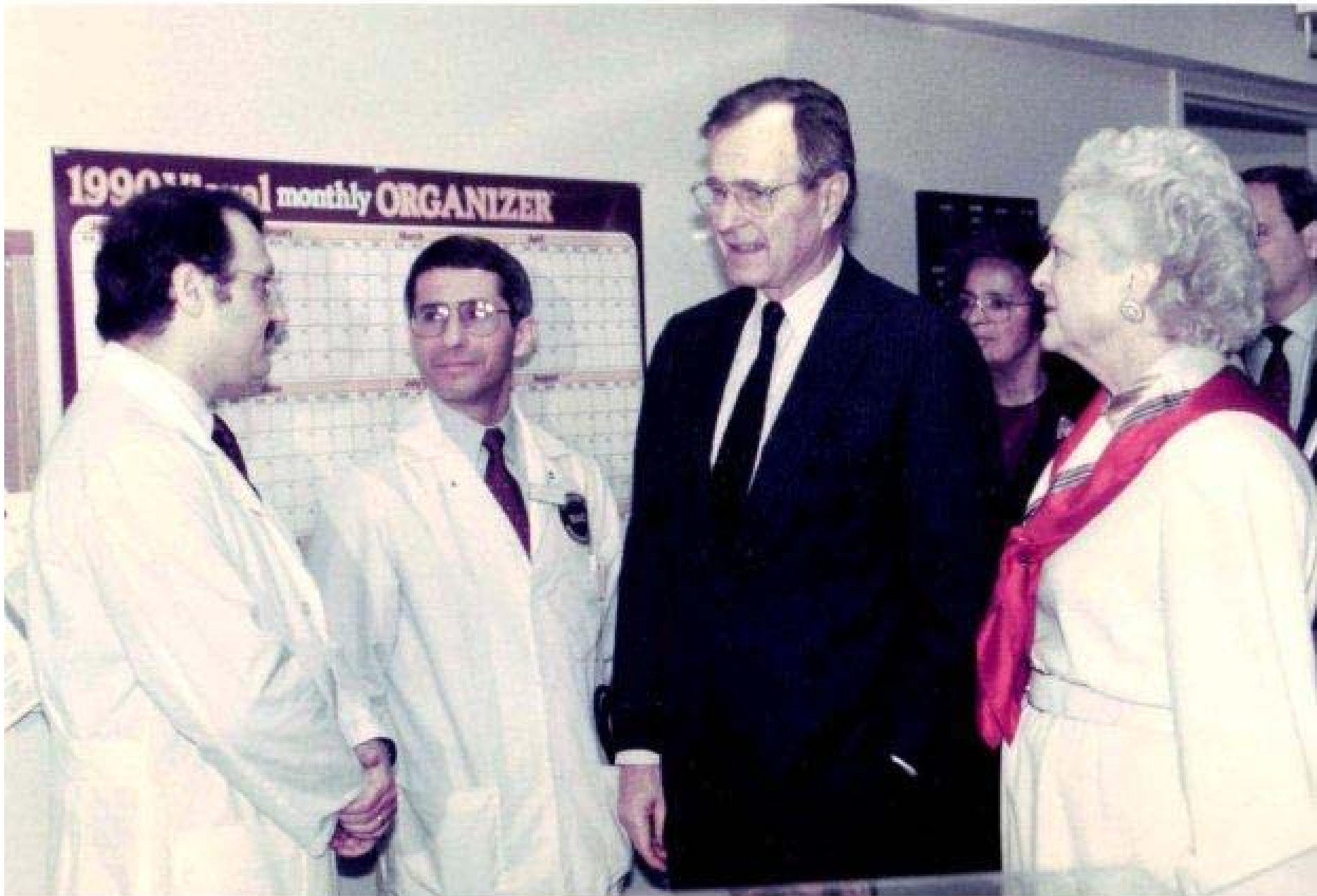
Interacting with Presidents



*To Dr. Anthony Fauci
With best wishes, Ronald Reagan*

itutes
lead

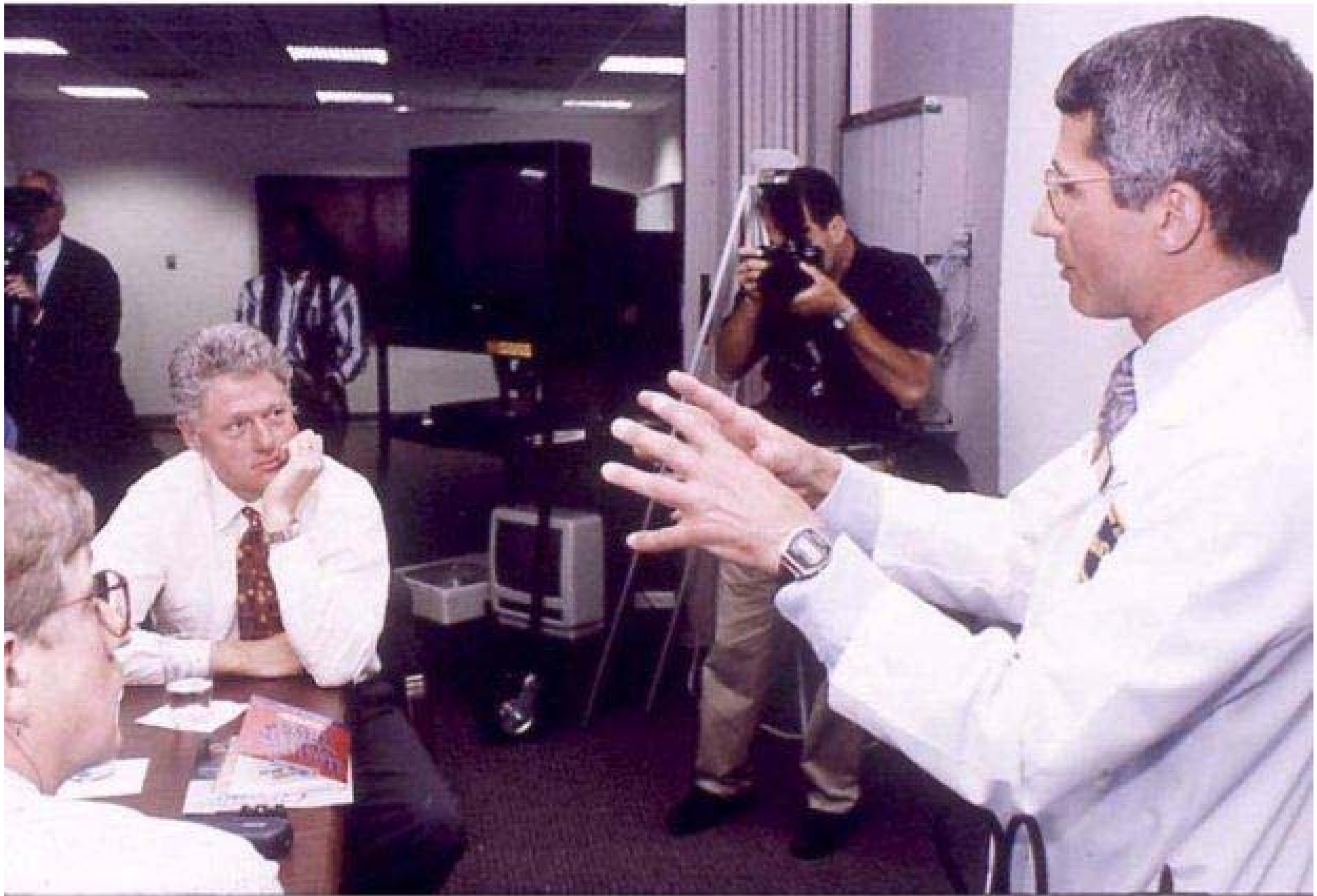


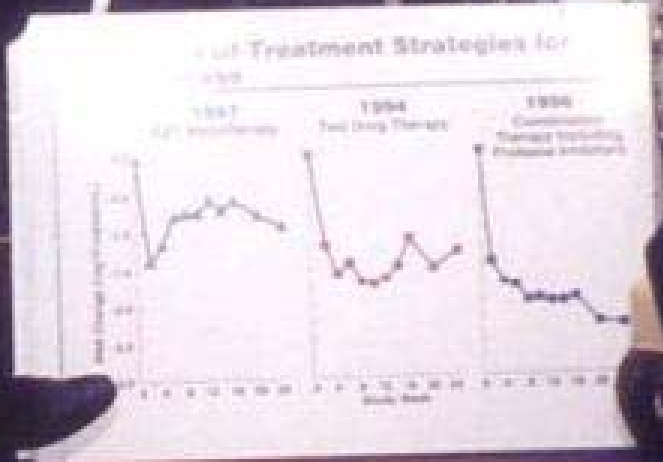
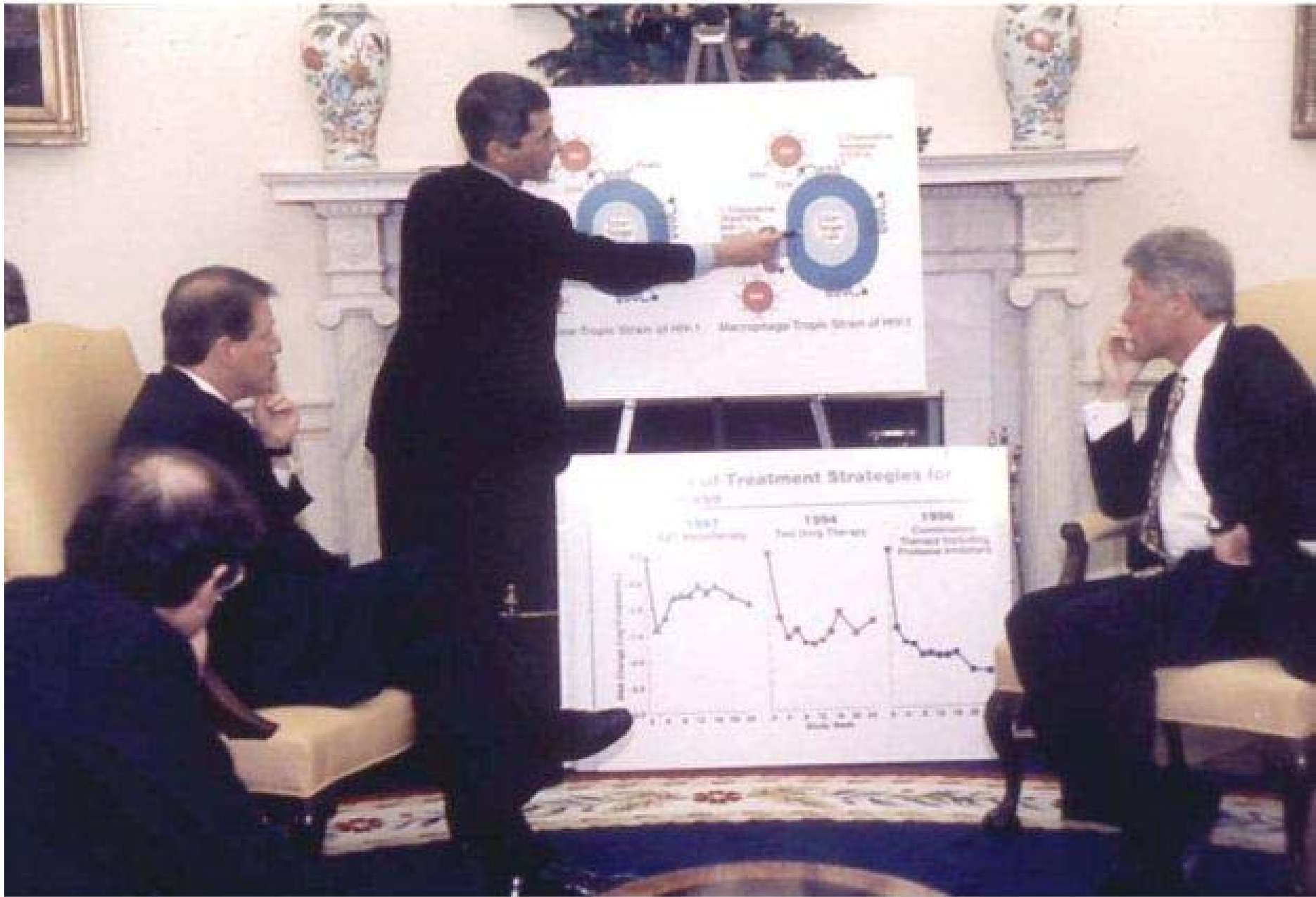

















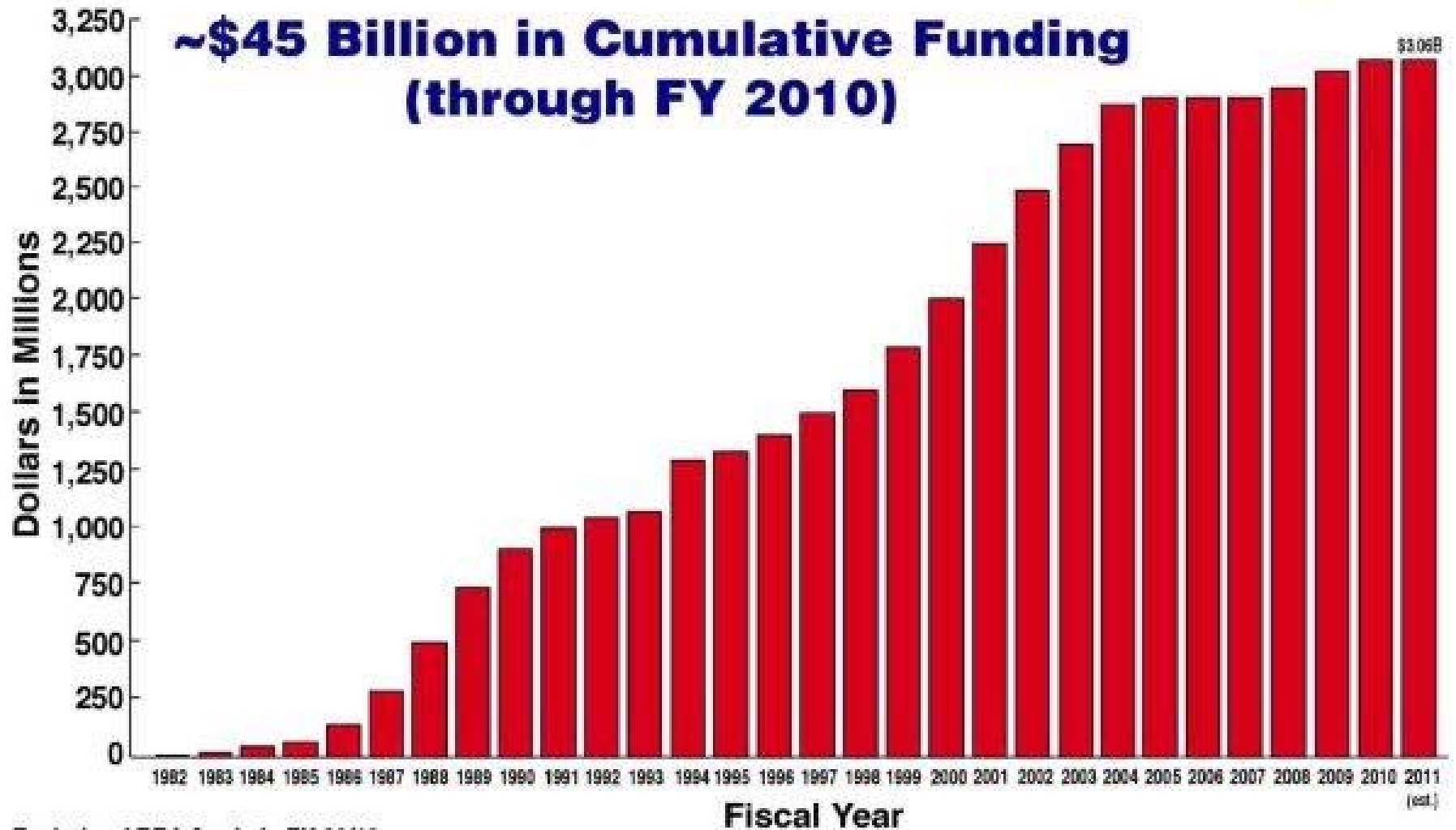


The Scope of the Global HIV/AIDS Pandemic – Current Estimates



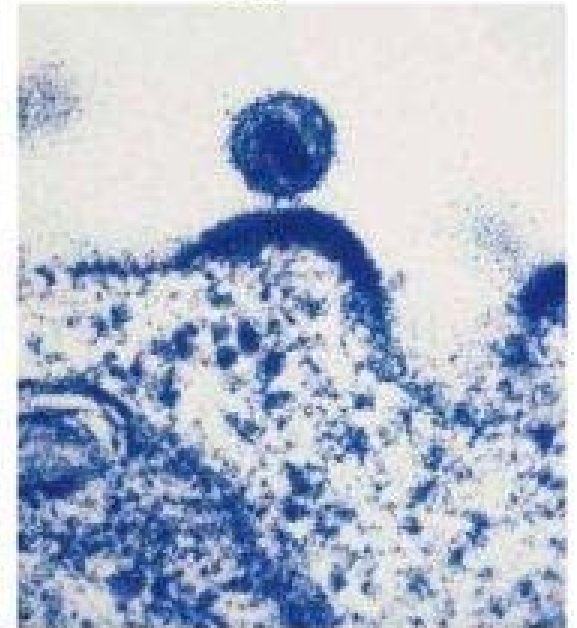
■ Cumulative HIV infections	65 million
■ People living with HIV/AIDS	34 million
■ New HIV infections in 2009	2.6 million
■ Deaths due to AIDS in 2009	1.8 million
■ Cumulative AIDS deaths	~30 million

NIH HIV/AIDS Research Funding



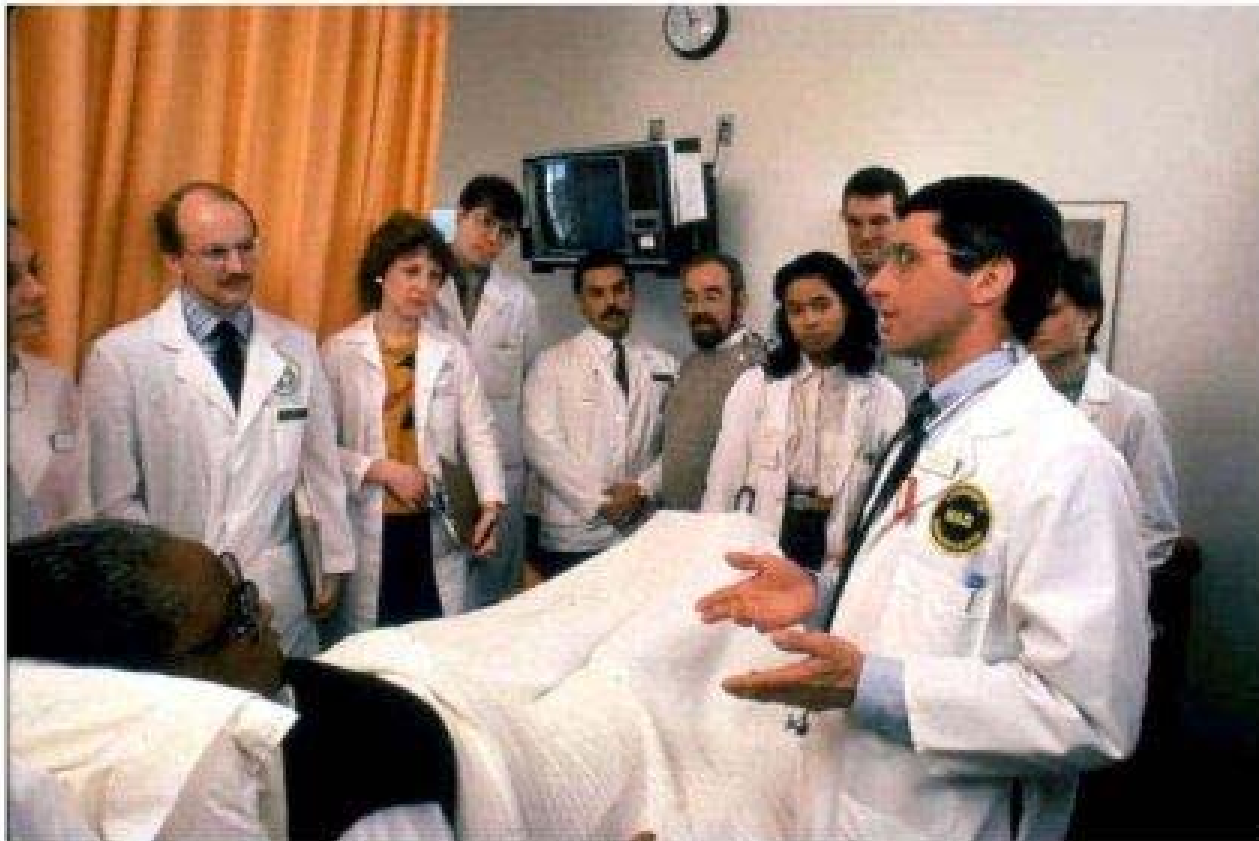
Advances in HIV Science

- Etiology
- Diagnosis
- Molecular Virology and Epidemiology
- Natural History
- Pathogenesis
- Treatment
- Prevention
- Vaccine Development



Treatment of the HIV-Infected Individual

Rounding on AIDS Ward, NIH Clinical Center, Early 1980s



■ **Median survival of AIDS patients: ~6-8 months**



The
**New England
Journal of Medicine**

ISSN 0028-2718 • THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

VOLUME 317

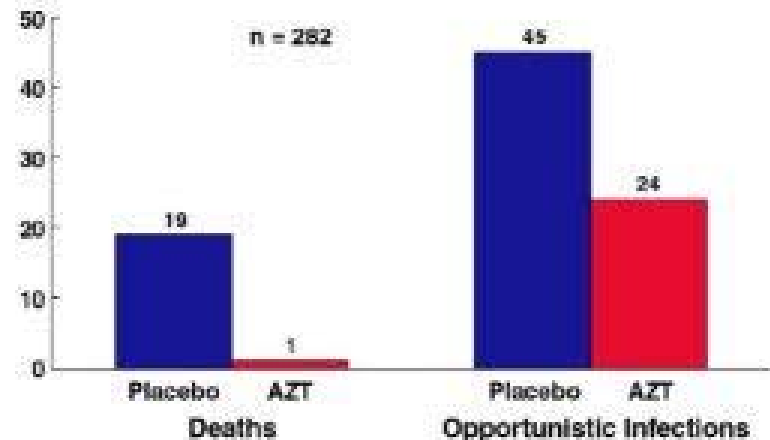
July 23, 1987

NUMBER 4

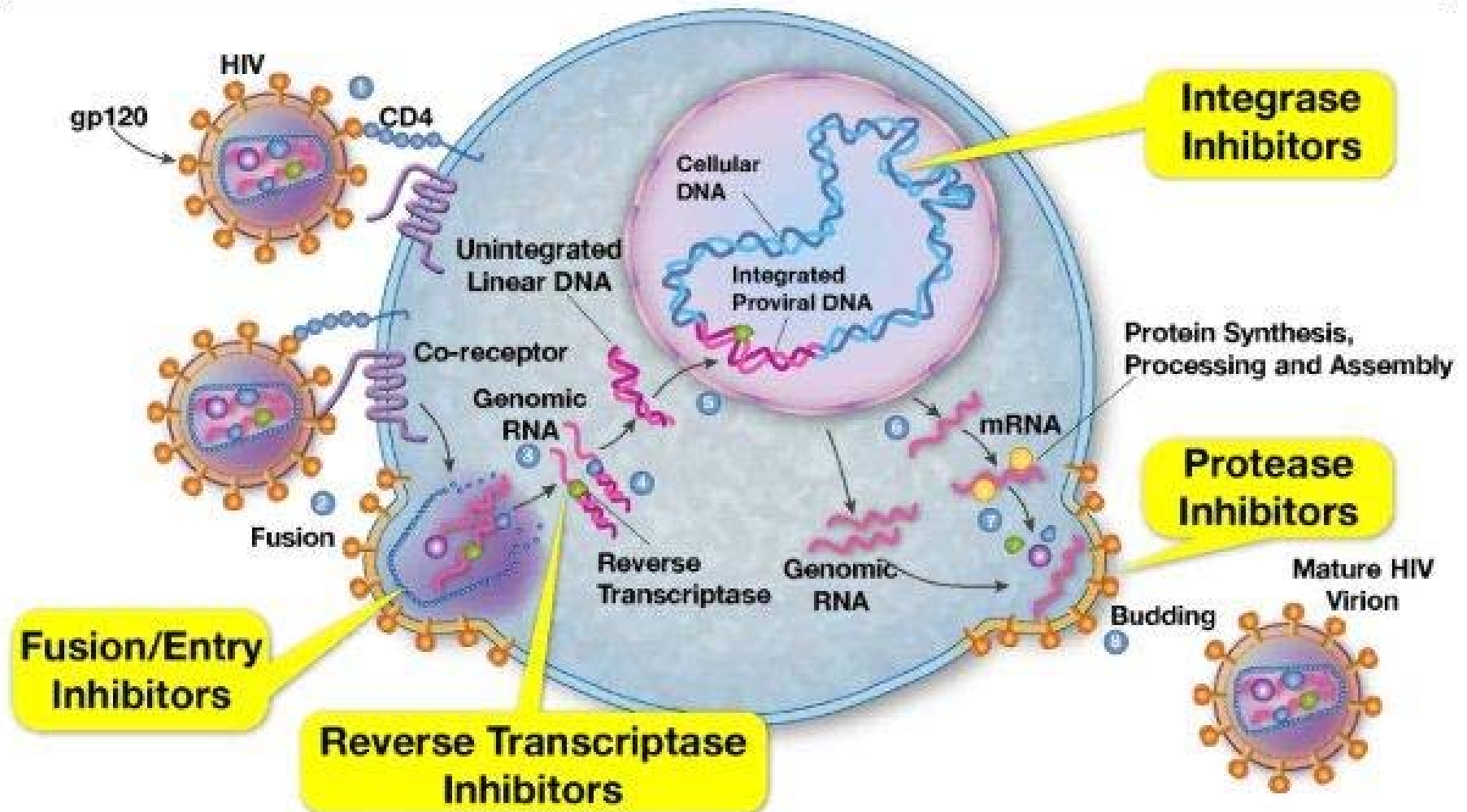
**The Efficacy of
Azidothymidine (AZT)
in the Treatment of
Patients with AIDS
and AIDS-Related
Complex: A Double-
Blind, Placebo-
Controlled Trial**

Margaret A. Fischl, et al.

**BW 002: 24-Week Study of AZT vs.
Placebo in Patients with AIDS or ARC**



HIV Replication Cycle: Targets for Antiretroviral Therapy



FDA-Approved Antiretroviral Drugs

NRTI

- Zidovudine
- Didanosine
- Zalcitabine
- Stavudine
- Lamivudine
- Abacavir
- Tenofovir
- Emtricitabine

NNRTI

- Nevirapine
- Delavirdine
- Efavirenz
- Etravirine
- Rilpivirine

PI

- Saquinavir
- Ritonavir
- Indinavir
- Nelfinavir
- Amprenavir
- Lopinavir
- Atazanavir
- Fosamprenavir
- Tipranavir
- Darunavir

Fusion Inhibitor

- Enfuvirtide (T-20)

Entry Inhibitor

- Maraviroc

Integrase Inhibitor

- Raltegravir

Combinations

- 6 available, combining 2 or 3 drugs



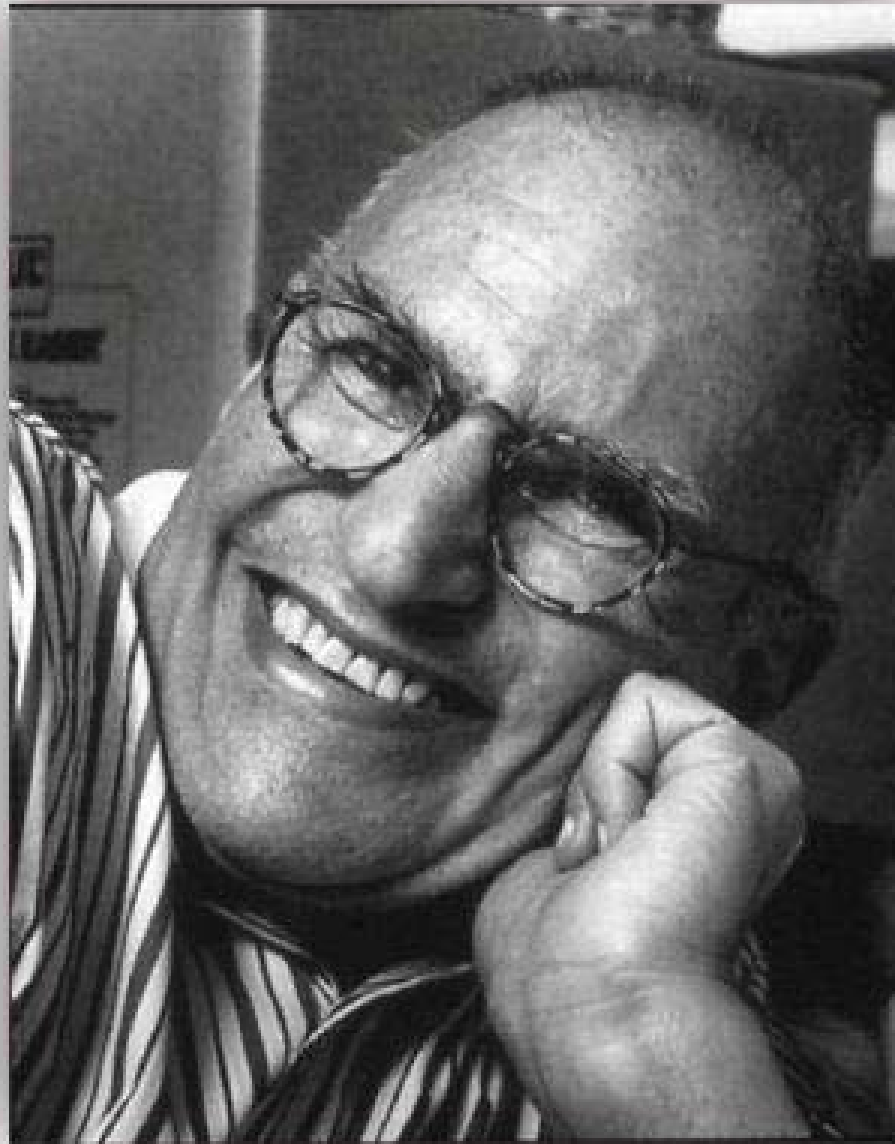


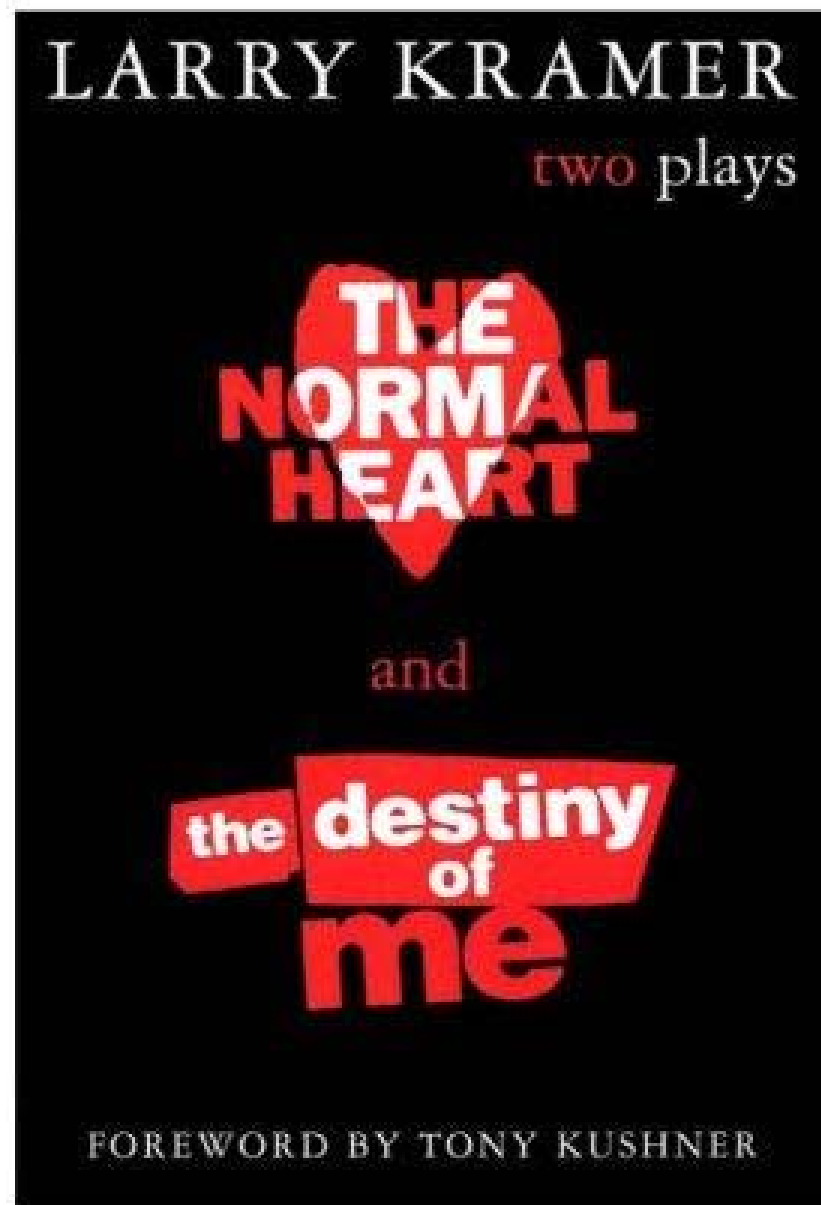
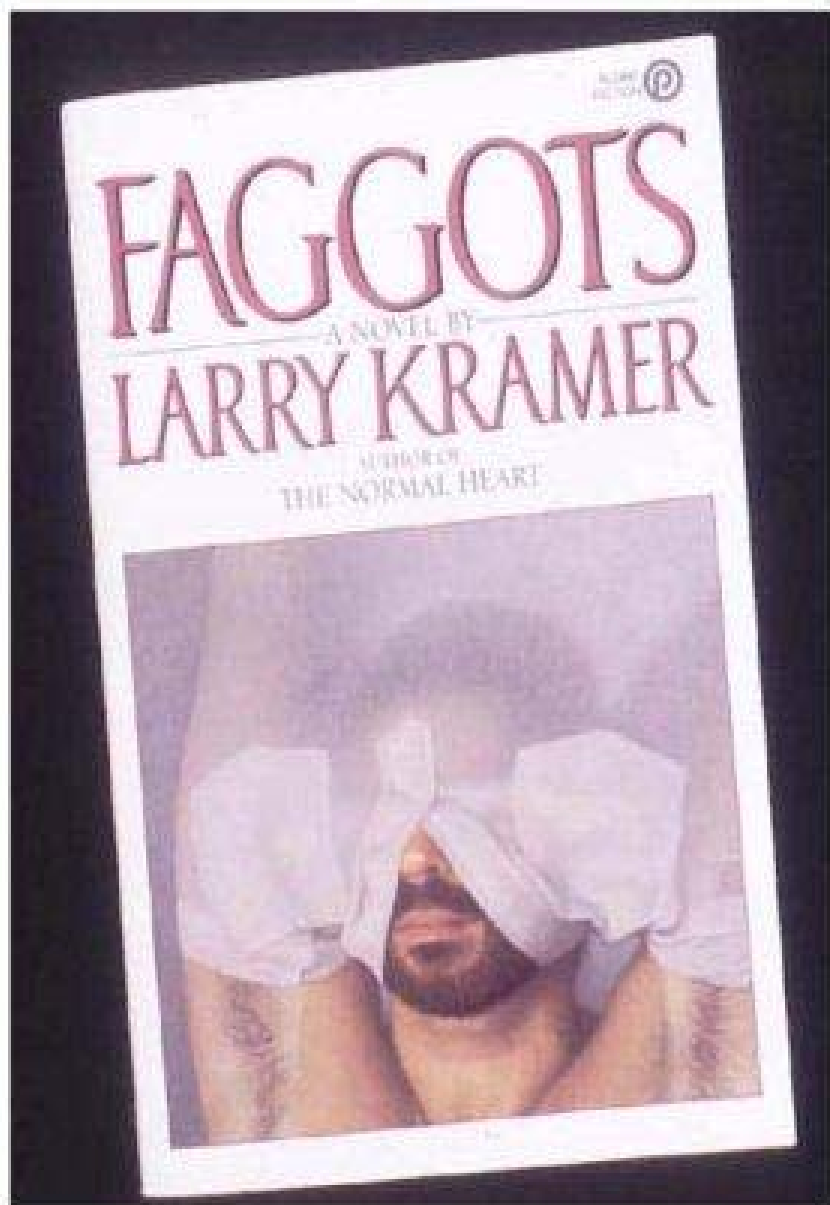
Life Expectancy of Recently Diagnosed Asymptomatic HIV-infected Patients Approaches that of Uninfected Individuals

A. van Sighem et al. on behalf of the ATHENA National Observational Cohort Study

- **Life expectancy** for HIV-infected patients (without AIDS) aged 25 yrs at six months postinfection
 - Men: an additional 52.7 yrs** (versus 53.1 yrs in general population)
 - Women: an additional 57.8 yrs** (versus 58.1 yrs in general population)

The Role of Activism in HIV/AIDS Science





San Francisco Examiner

IMAGE

June 26, 1988

IMAGE ESSAY

By Larry Kramer

I CALL YOU MURDERERS

An open letter to an incompetent idiot, Dr. Anthony Fauci,
of the National Institute of Allergy and Infectious Diseases:

I have been screaming at the National Institutes of Health since I first visited your Animal House of Horrors in 1984. I called you monsters then and I called you idiots in my play, *The Normal Heart*, and now I call you murderers.

You are responsible for supervising all government-funded AIDS treatment research programs. In the name of right, you make decisions that cost the lives of others. I call that murder.

At hearings on April 29 before the

House Subcommittee on Human Resources, after almost eight years of the worst epidemic in modern history, perhaps to be the worst in all history, you were panicked into admitting publicly what some of us have been claiming since you took over some three years ago.

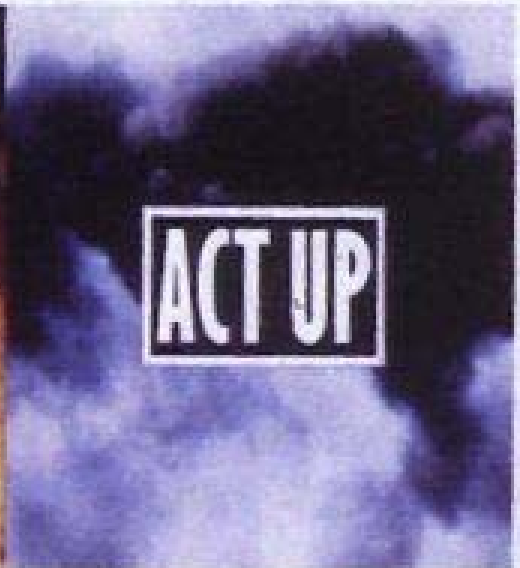
You admitted that you are an incompetent idiot.

Over the past four years, \$374 million has been allocated for AIDS



FEDERAL AIDS TREATMENT RESEARCH, RUN BY THE NATIONAL INSTITUTES OF HEALTH (N.I.H.)...
LET THE RECORD SHOW...TEN YEARS...ONE BILLION DOLLARS...ONE DRUG

STORM THE N.I.H.



MAY 21. INFO: 212-989-1114









Martin Delaney, 1945-2009

The New York Times

June 26, 1989

AIDS Researcher Seeks Wide Access to Drugs in Tests

By Gina Kolata

In a major shift long sought by those involved in the fight against AIDS, the chief of Federal AIDS research has called for a new system that would allow patients far greater access to experimental drugs.

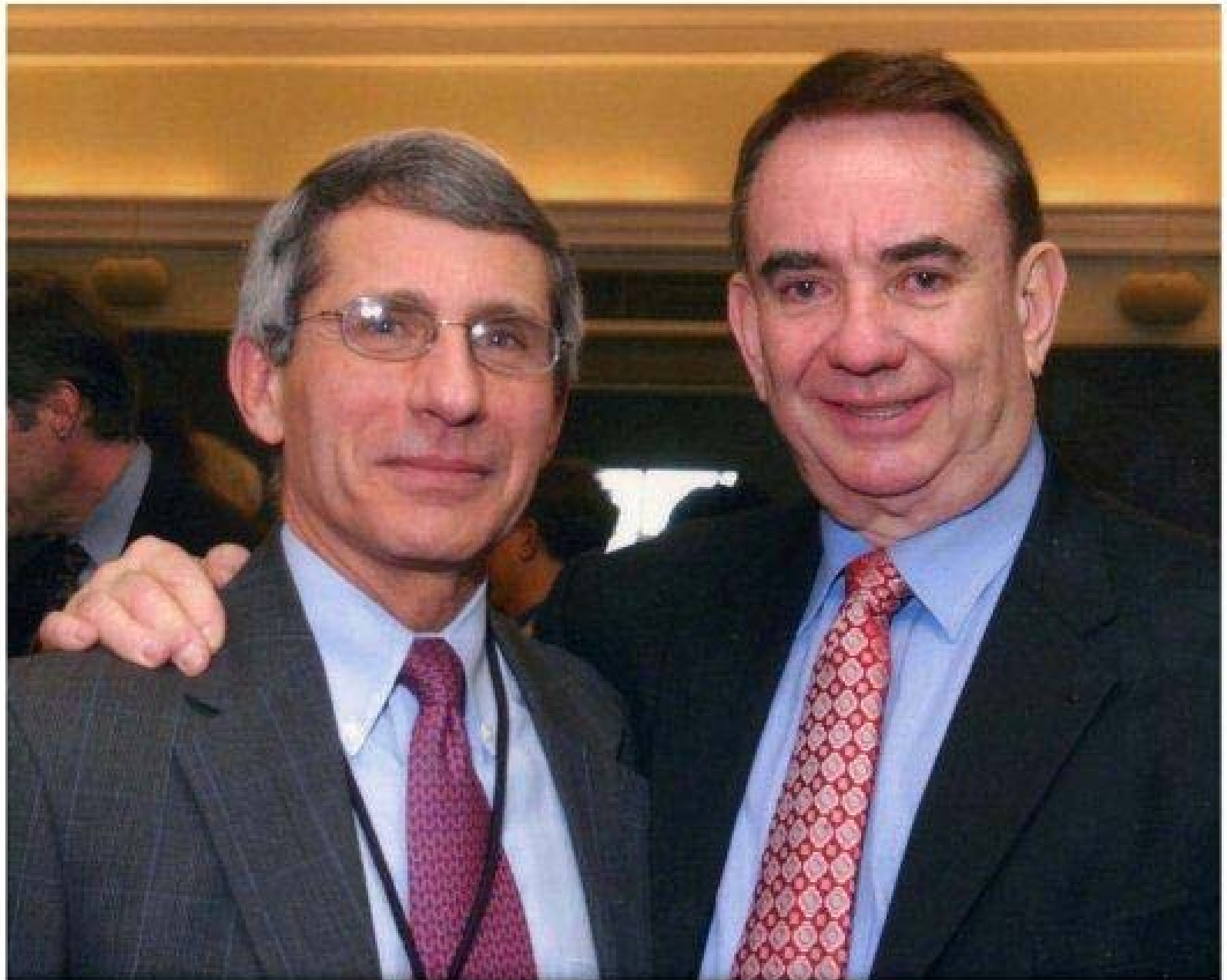
Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, said such a system would provide promising drugs to some people with AIDS at the same time as the drugs are undergoing rigorous clinical trials. "I call this a parallel-track approach to clinical trials," Dr. Fauci said in a telephone interview.

Global March for Treatment Access Durban, South Africa, July 9, 2000

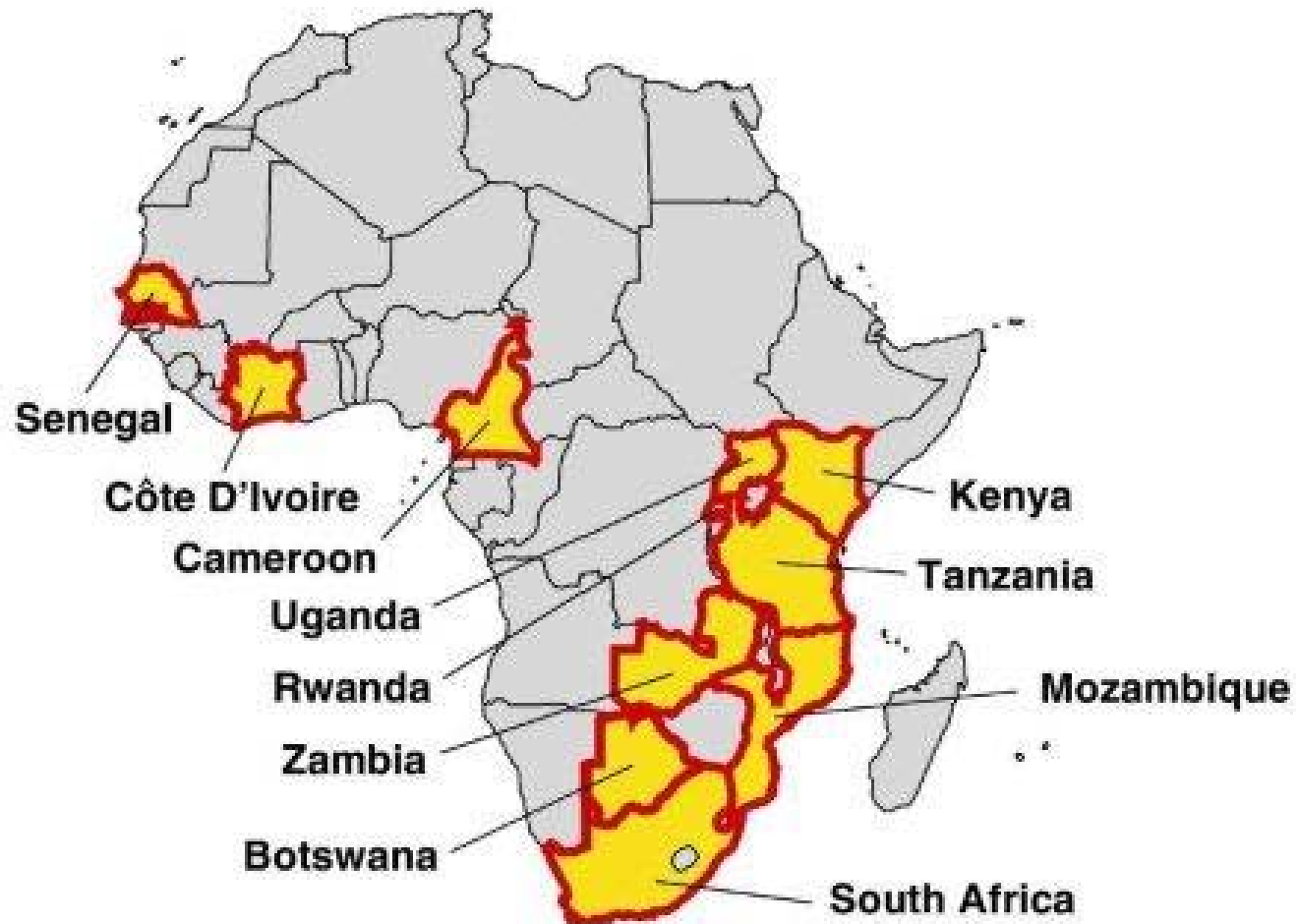


Credit: Greg McNeal, African-American AIDS Policy and Training Institute

The Birth of PEPFAR



Addressing HIV/AIDS: Visits to 11 Countries in Sub-Saharan Africa











NIAID Laboratory of Immunoregulation, 2002



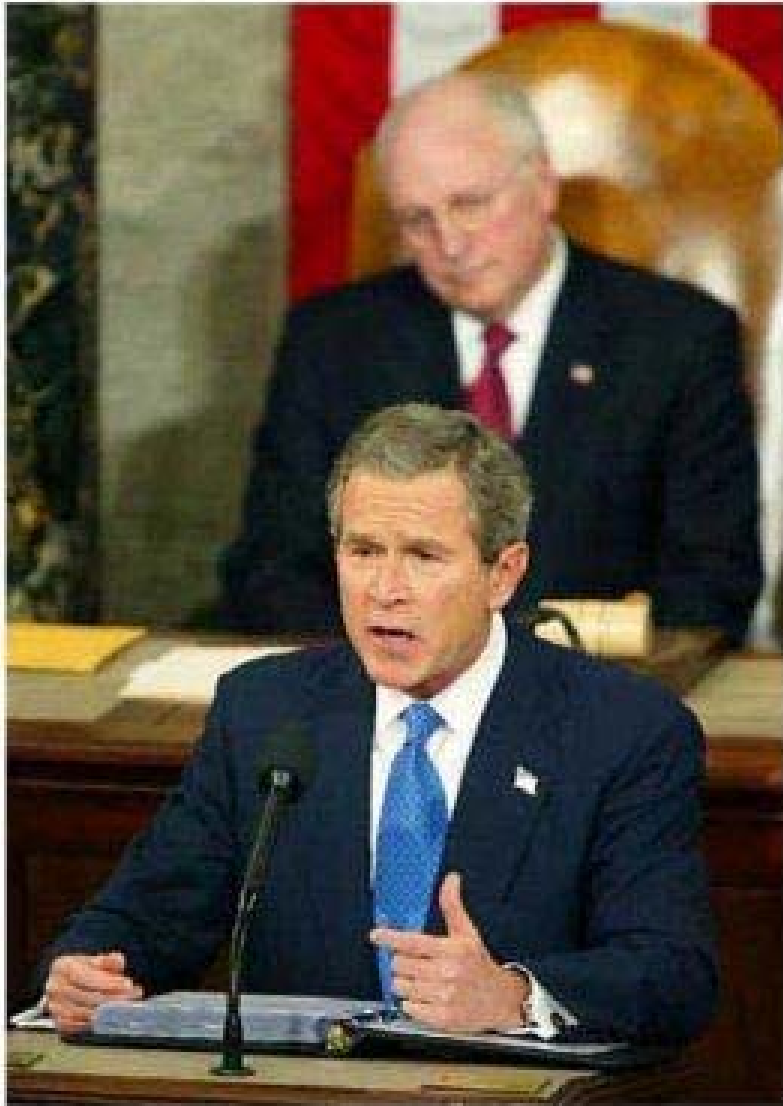
NIAID Laboratory of Immunoregulation, 2002



Joshua B. Bolten







State of the Union Address, January 28, 2003

- **President Bush
announces the
Emergency Plan for
AIDS Relief**



Mark R. Dybul, M.D.

Sworn in as United States Global AIDS Coordinator
October 10, 2006



Eric Goosby, M.D.
U.S. Global AIDS Coordinator



THE UNITED STATES PRESIDENT'S EMERGENCY PLAN FOR AIDS RELIEF

PEPFAR Results (as of Sept. 30, 2010)

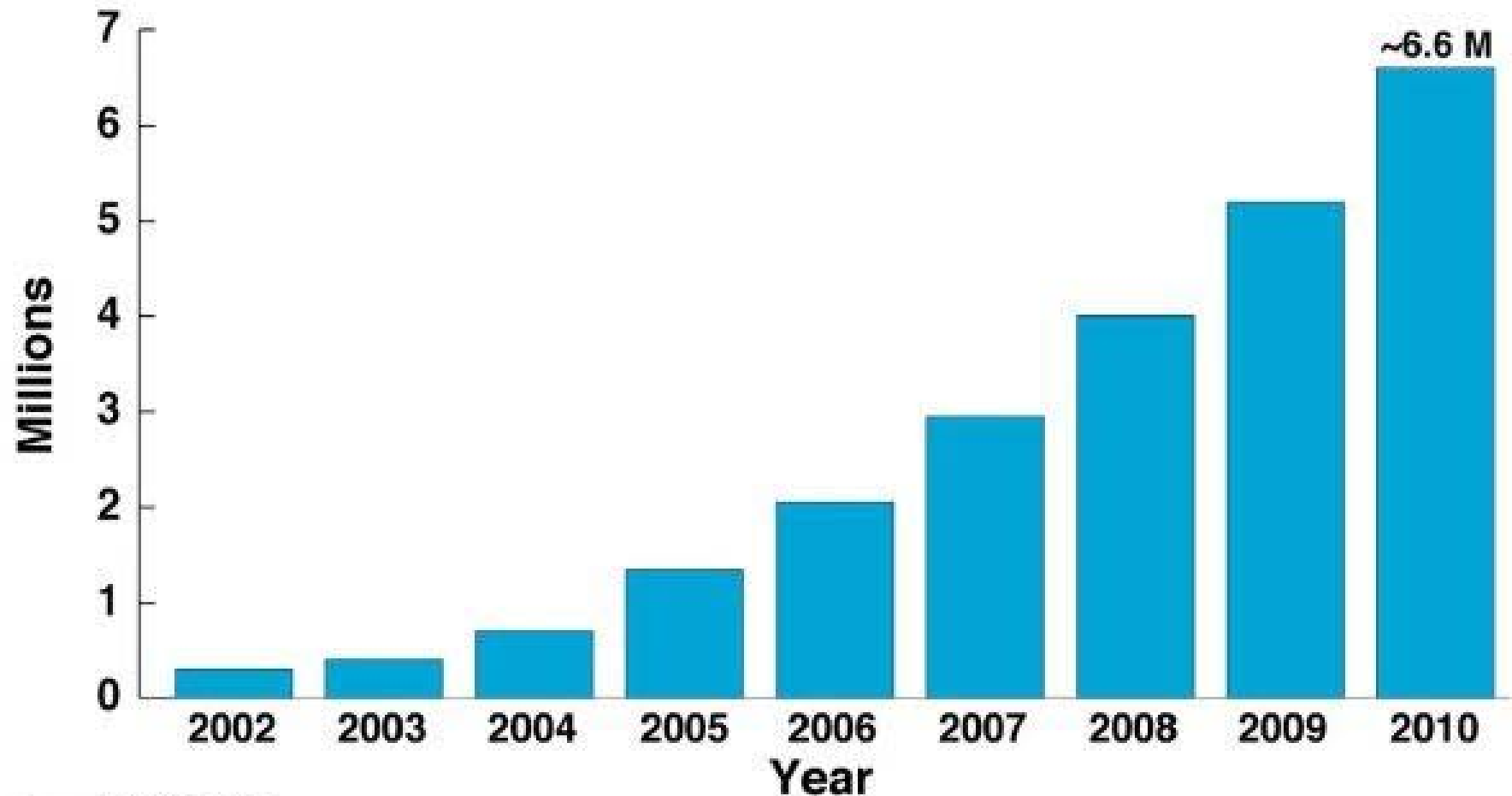
- **>3.2 million people are receiving ARVs for their own health**
- **> 114,000 infant HIV infections were averted with ARV prophylaxis in 2010 alone**
- **>11 million people received care and support in 2010, incl. ~3.8 million orphans and vulnerable children**

Examples of Programs Providing HIV/AIDS Prevention, Treatment and Care to Developing Nations

- **President's Emergency Plan for AIDS Relief (PEPFAR)**
- **Global Fund to Fight AIDS, Tuberculosis and Malaria**
- **Philanthropies and NGOs (e.g. Gates Fdtn., Clinton Fdtn., MSF)**



Number of People Receiving Antiretrovirals in Low- and Middle-Income Countries



Source: UNAIDS, 2011

Major Challenges Globally in the Treatment of HIV Disease

- <40% of people in need of ARV therapy in low- and middle-income countries are receiving it
- For every person put on ARV therapy in 2010, 2-3 others were newly infected with HIV



Prevention



Source: National Library of Medicine



To Chick Koop
With best wishes, + Regards
Ronald Reagan

The New York Times

September 17, 1981

Dr. Koop Is Nominated To Be Surgeon General

WASHINGTON — President Reagan today formally made his long-delayed nomination of Dr. C. Everett Koop, a prominent pediatric surgeon who has been active in the anti-abortion movement, to be Surgeon General of the United States.

The Washington Post

November 17, 1981

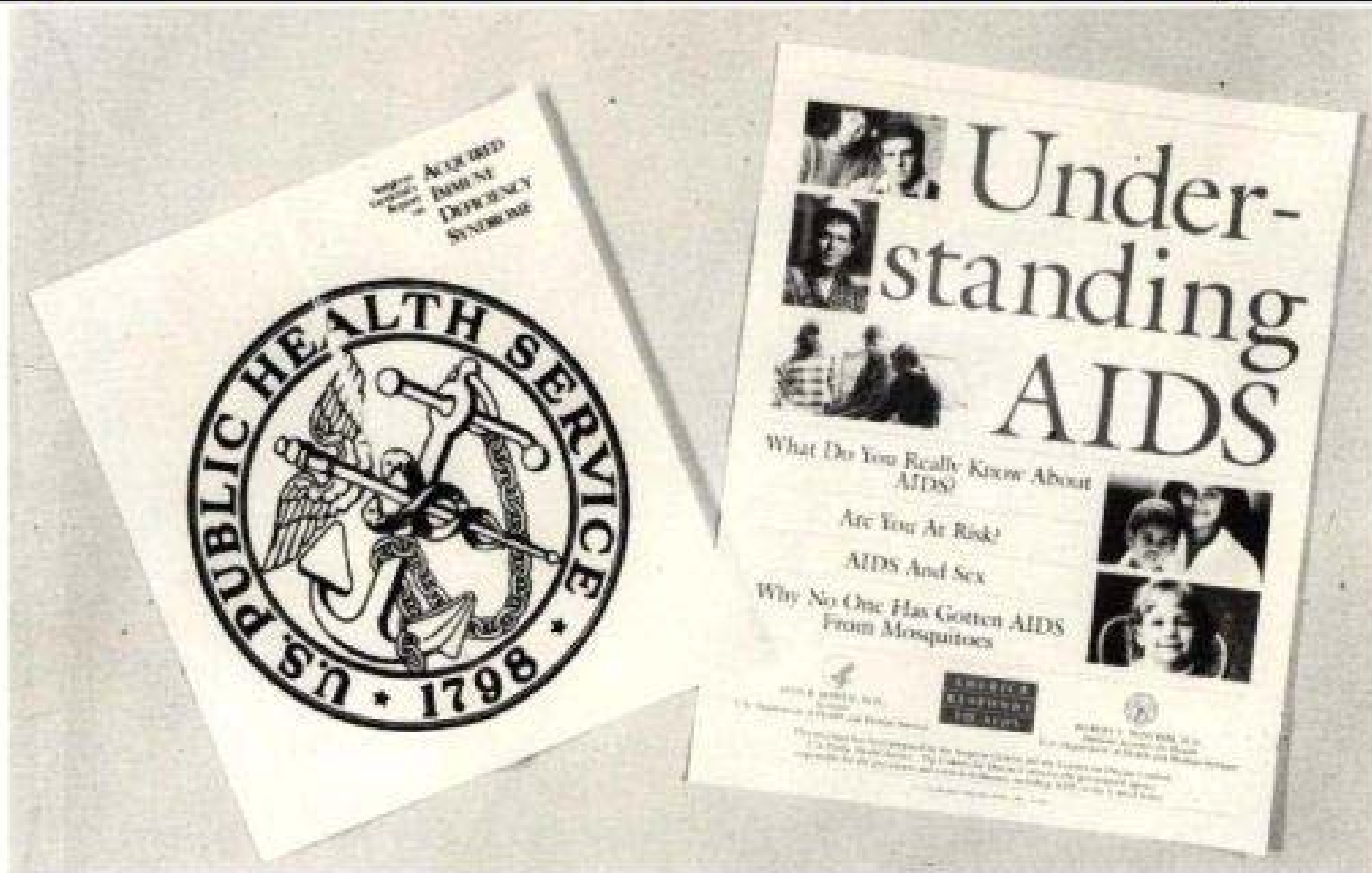
Senate Confirms Koop As Surgeon General







AIDS-Related Reports of Surgeon General C. Everett Koop





"IF ANYTHING COMES IN THE MAIL FROM THE SURGEON GENERAL, DON'T OPEN IT!"

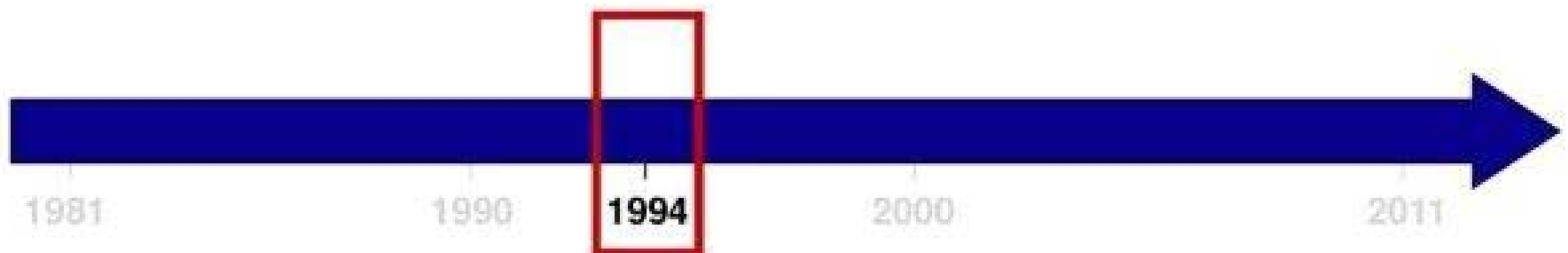
30 Years of HIV/AIDS

**Prevention Tools =
Education, Behavior
Modification, Condoms,
Clean Syringes,
Drug/Alcohol Treatment**

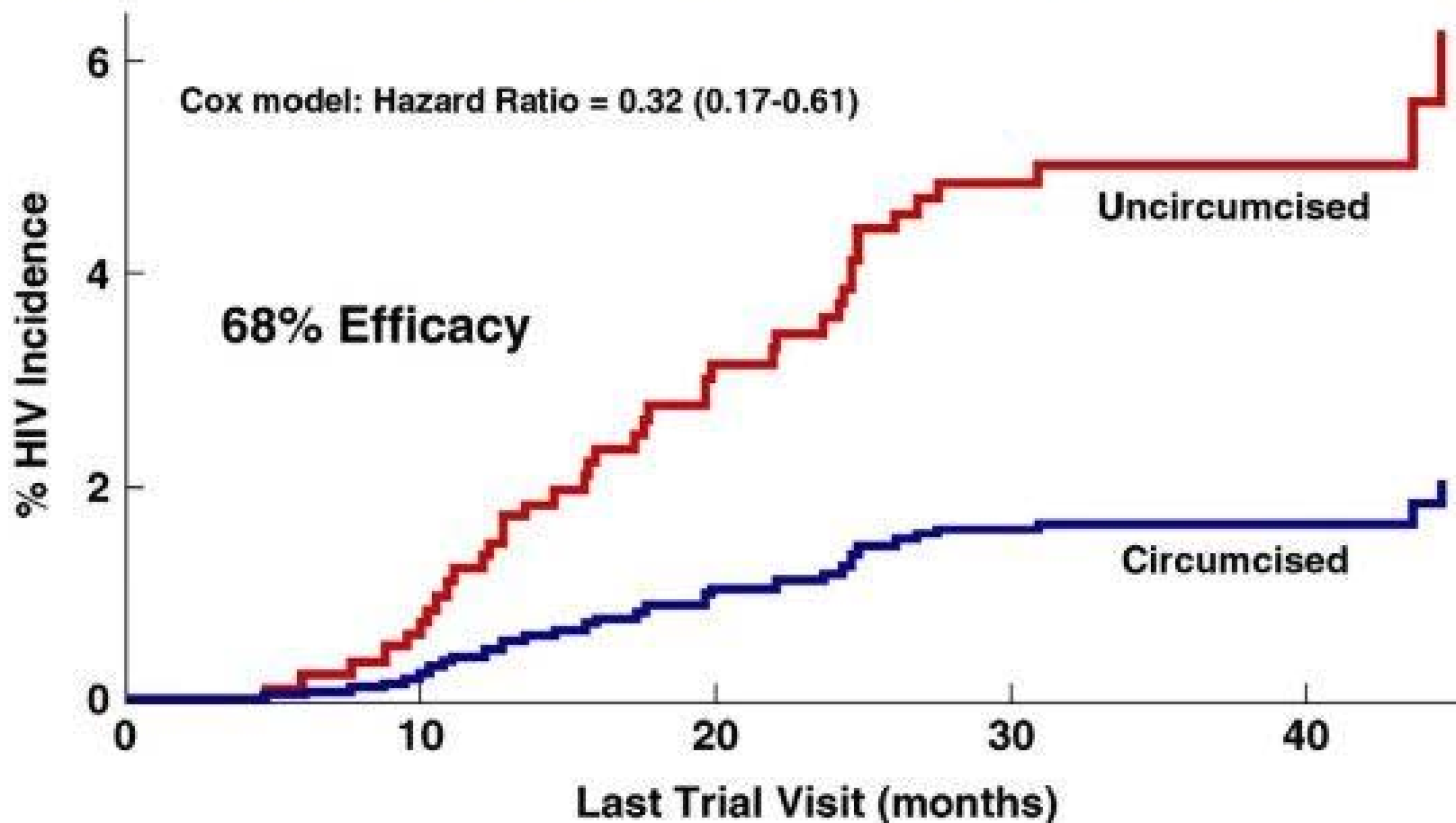


30 Years of HIV/AIDS

**ACTG 076: AZT
Reduces
Mother-to-Child
Transmission of
HIV**



Effect of Adult Male Circumcision on HIV Incidence in Rakai, Uganda



3 September 2010

Science

Effectiveness and Safety of Tenofovir Gel, an Antiretroviral Microbicide, for the Prevention of HIV Infection in Women

QA Karim, SS Karim et al.

AAAS

- **Double-blind, randomized controlled trial (n=889) in sexually active, HIV-uninfected 18- to 40-year-old women in South Africa**
- **1% tenofovir vaginal gel reduced HIV incidence by 39% overall, and by 54% with high gel adherence (>80 percent)**
- **No serious adverse events**



The
**New England
Journal of Medicine**

Established in 1811 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

Published online November 23, 2010

Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men

RM Grant et al. and the iPrEx Study Team

- **n= 2,499 HIV-seronegative men or transgender women who have sex with men in Brazil, Ecuador, Peru, South Africa, Thailand and the United States**
- **Randomized to receive emtricitabine and tenofovir disoproxil fumarate (FTC-TDF, Truvada) or placebo once daily**
- **44% reduction in HIV incidence overall in FTC-TDF group; 73% reduction with high adherence (>90% of days)**

Pre-Exposure Prophylaxis Reduces HIV Infection Risk Among Heterosexuals

- Two randomized studies in Africa found that daily antiretroviral therapy can reduce the risk for HIV infection among high-risk heterosexuals.
- Treating uninfected individuals with 1 or 2 antiretroviral drugs reduced the risk of HIV acquisition by 62-73%.

Study site in Thika, Kenya



Source: U of Washington



U.S. Department of Health and Human Services

NIH News

National Institutes of Health

National Institute of Allergy and Infectious
Diseases (NIAID)

<http://www.niaid.nih.gov/>

FOR IMMEDIATE RELEASE

Thursday, May 12, 2011

Treating HIV-infected People with Antiretrovirals Significantly Reduces Transmission to Partners

Findings Result from NIH-funded International Study

- **HPTN 052**
- **1,763 HIV-serodiscordant couples in 9 countries**
- **96% reduction in HIV transmission when ART started in HIV-infected partner at CD4 count of 350-550 compared to <250**

The Search for an HIV Vaccine - 24 Years and Counting

- First HIV vaccine clinical trial, 1987 - gp160 subunit candidate

HHS News

U.S. Department of Health and Human Services

FOR RELEASE
Tuesday, August 18, 1987
12 noon, EDT



www.hhs.gov/news

Dr. Robert E. Windom, assistant secretary for health, today announced that the National Institute of Allergy and Infectious Diseases is beginning tests in human volunteers of an experimental vaccine against acquired immunodeficiency syndrome (AIDS). This is the first clinical study of an AIDS vaccine to be approved by the Food and Drug Administration and to be conducted in the United States.

First Signal of Efficacy in an HIV Vaccine Clinical Trial



The
New England
Journal of Medicine

Established in 1811 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

Published at www.nejm.org -- October 20, 2009

Vaccination with ALVAC and AIDSVAX to Prevent HIV-1 Infection in Thailand

S Rerks-Ngarm, JH Kim et al. for the
MOPH-TAVEG Investigators

September 16, 2011

Science

**Novel Antibody
Response May
Explain HIV
Vaccine
Success**

AAAS

naturenews

September 17, 2011



**Clues Emerge to
Explain First
Successful HIV
Vaccine Trial**



The
**New England
Journal of Medicine**

Published in 1813 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

VOLUME 365

September 8, 2011

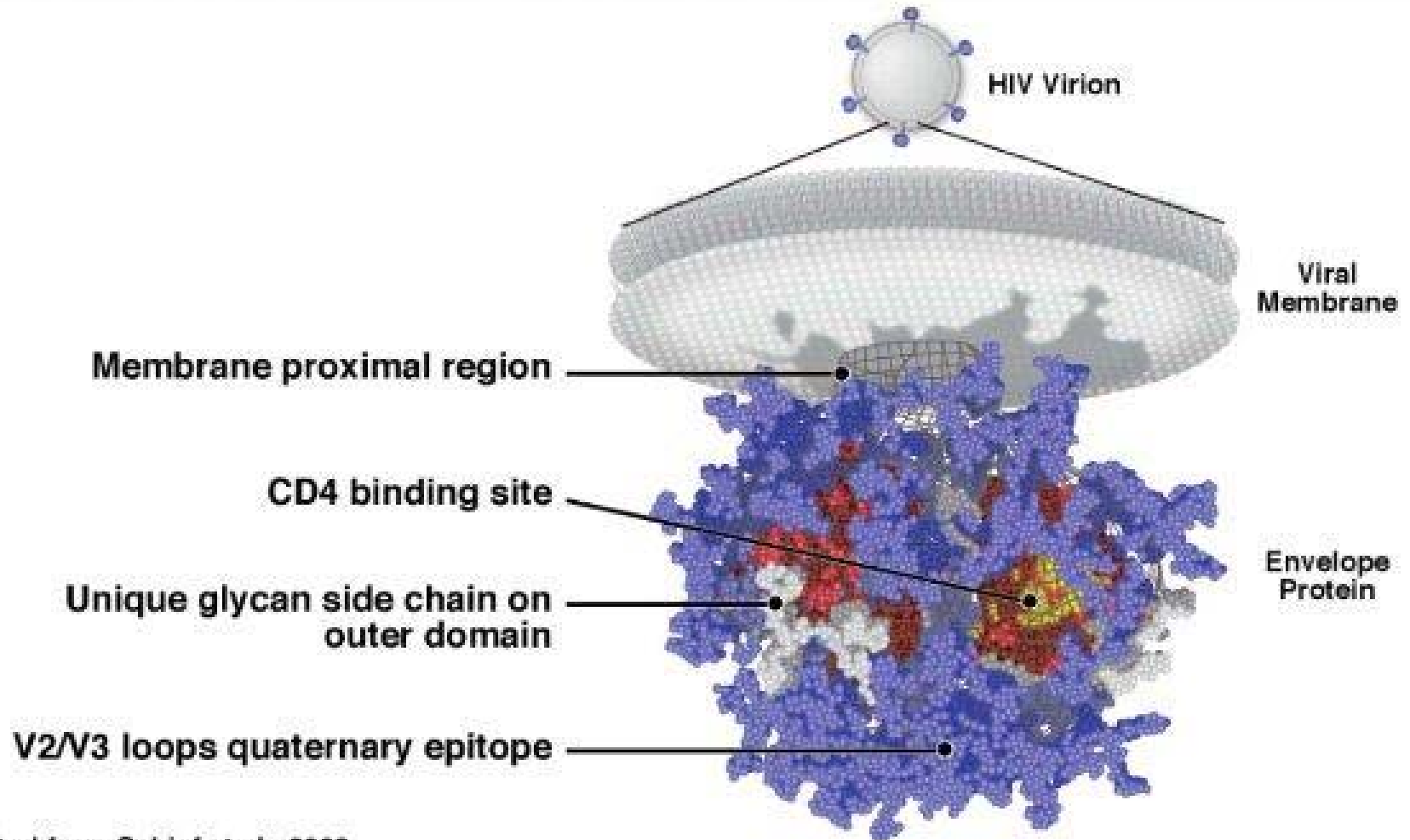
NUMBER 10

HIV Vaccine Development — Improving on Natural Immunity

Margaret I. Johnston, Ph.D., and Anthony S. Fauci, M.D.

Structure-Based HIV Vaccine Design

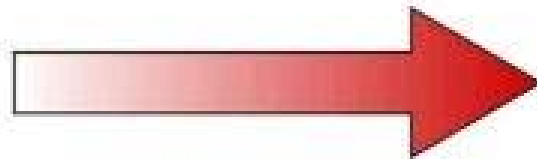
Epitopes Targeted by Broadly Neutralizing Human Monoclonal Antibodies



Adapted from Schief et al., 2009.

Critical Challenge in the Development of an HIV Vaccine

**Neutralizing
Epitope**



Immunogen

**Combination
HIV
Prevention**

Education

Condoms

Harm reduction

STI treatment

PrEP

**Testing/
counseling**

Microbicides

**Treatment as
Prevention**

Circumcision

**Drug/alcohol
treatment**

**Combination
HIV
Prevention**

Education

Condoms

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treatment

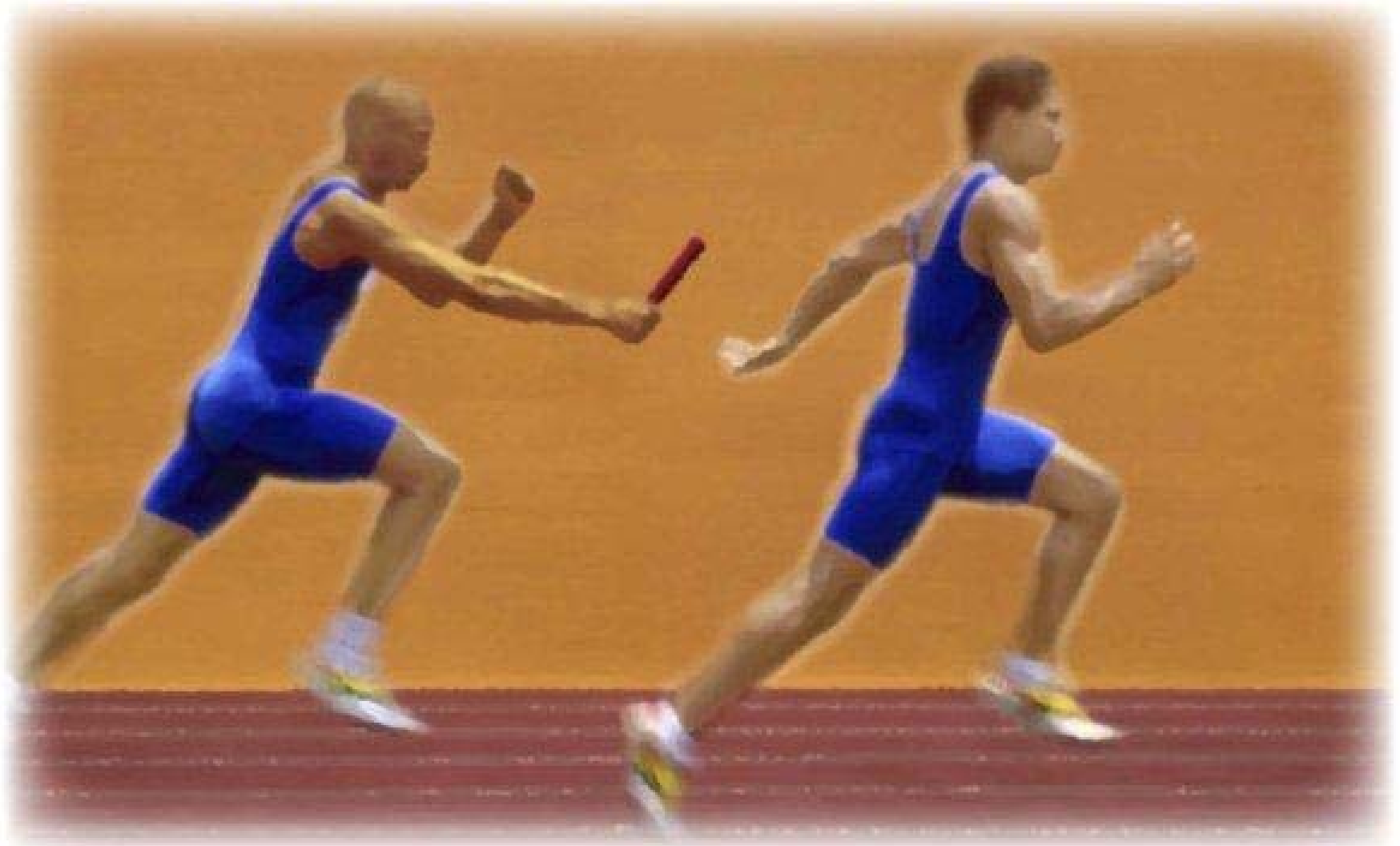


6th IAS Conference on HIV Pathogenesis, Treatment, and Prevention – Rome, Italy, July 17-20, 2011



Scientific Advances

Implementation





AIDS: Let Science Inform Policy

Anthony S. Fauci



“We now have an unprecedented opportunity, based on solid scientific data, to control and ultimately end the AIDS pandemic.

...Major investments in implementation now will save even greater expenditures in the future; and in the meantime, countless lives can be saved.”