Outline

- Where we’ve been
- Where we are
- Where we can be
Kaposi's Sarcoma and *Pneumocystis* Pneumonia Among Homosexual Men — New York City and California

During the past 30 months, Kaposi's sarcoma (KS), an uncommonly reported malignancy in the United States, has been diagnosed in 26 homosexual men (20 in New York City [NYC]; 6 in California). The 26 patients range in age from 26-51 years (mean 39 years). Eight of these patients died (7 in NYC, 1 in California)—all 8 within 24 months after KS was diagnosed. The diagnoses in all 26 cases were based on histopathological examination of skin lesions, lymph nodes, or tumor in other organs. Twenty-five of the 26 patients were white, 1 was black. Presenting complaints from 20 of these patients are shown in Table 1.
1983 Almanac

- “Evil Empire” speech
- Mortgage rate: 12%
- “Year of the Bible”
- U.S. invades Granada
AIDS and DRUGS
NO TE PILGRAM CARE
TIPS
The best prevention is "My Prevention!"
Official Program

INTERNATIONAL CONFERENCE ON ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)
April 14-17, 1985

Georgia World Congress Center · 285 International Blvd., N.W.
Atlanta, Georgia, U.S.A.
Monday, April 15

8:30 OPENING SESSION
Auditorium, Georgia World Congress Center
Call to Order
Gary R. Noble, Program Chairman
Welcome
The Honorable Andrew Young, Mayor of Atlanta
Fakhry Assaad, The World Health Organization, Geneva
Introduction of the Keynote Speaker
Donald R. Hopkins, Acting Director
Centers for Disease Control, Atlanta
Keynote Address:
The AIDS Challenge
The Honorable Margaret M. Heckler
Secretary of Health and Human Services
Washington, DC

9:15 PLENARY SESSION A
CHAIR: James B. Wyngaarden, Director
National Institutes of Health, Bethesda
The Epidemiology and Prevention of AIDS
James W. Curran, Center for Infectious Diseases, Centers for Disease Control, Atlanta

10:15

11:15 2. EPIDEMIOLOGY
Room 313
CHAIR: Mervyn Silverman, San Francisco Hlth. Dept.
Surveillance for AIDS in Children
Martha F. Rogers*, P. A. Thomas, R. M. Selik, A. M. Hardy, M. C. Rogers, W. M. Morgan, CDC, Atlanta, and New York City Dept. of Hlth.
Mothers of Infants with the Acquired Immunodeficiency Syndrome: Outcome of Subsequent Pregnancies
Gwendolyn B. Scott*, M. Fischl, N. Klimas, M. A. Fletcher, G. Dickinson, W. Parks, Univ. Miami, FL
Epidemiological Features of Pediatric Acquired Immunodeficiency Syndrome in New Jersey
Immunodeficiency and HTLV-III/LAV Serology in Heterosexual Partners of AIDS Patients
C. A. Harris*, C. Cebadilla, M. Robert-Guroff, R. S. Klein, G. H. Friedland, V. S. Kalayanaraman, et al., Montefiore Med. Ctr, Bronx, NY; NCI, NIH, Bethesda, MD; and CDC, Atlanta
Household Transmission of HTLV-III in Zaire
Jonathan M. Mann*, H. Francis, B. M. Kapita, K. Ruti, T. Quinn, J. W. Curran, CDC, Atlanta; NIAID, NIH, Bethesda, MD; Mama

Viral Data's AIDS (84) 28:1
GI: 500,000 - 1,000,000 unaffected.
1-20% "Complication rate" = AIDS.
ELISA Test For HTLV-III Antibody
Evolution of HIV Tests
Four Generations
Evolution of HIV Tests

- 1\textsuperscript{st} generation: whole viral lysate, detects IgG antibody
Western blot

1st Generation
The Public Health Service recommends that no positive test results be given to clients/patients until a screening test has been repeatedly reactive (i.e., greater than or equal to two tests) on the same specimen and a supplemental, more specific test such as the Western blot has been used to validate those results.
1989 Almanac

- Berlin Wall dismantled
- Tiananmen Square
- Exxon Valdez
- U.S. invades Panama
Also State of the Art in 1989
1996 Almanac

- U.S. Government shutdown
- Boris Yeltsin re-elected
- Mad cow disease strikes Britain
- Militant Taliban seize Kabul
- U.S. invades no one
Evolution of HIV Tests

- 1\textsuperscript{st} generation: whole viral lysate, detects IgG antibody
- 2\textsuperscript{nd} generation: synthetic peptides, detects IgG antibody

Approximately 25 million persons each year in the United States are tested for antibody to human immunodeficiency virus (HIV). Publicly funded counseling and testing (CT) programs conduct approximately 2.5 million of these tests each year. CT can have important prevention benefits (1); however, in 1995, 25% of persons testing HIV-positive and 33% of persons testing HIV-negative at publicly funded clinics did not return for their test results (2). Rapid tests to detect HIV antibody can be performed in an average of 10 minutes (3), enabling health-care providers to supply definitive...
New Recommendation

- Health-care providers should **provide preliminary positive test results** before confirmatory results are available in situations where tested persons benefit.
OraQuick Advance
Multispot HIV-1/HIV-2
Clearview Complete
MedMira Reveal G3
INSTI
Chembio Stat Pak

2nd Generation
2004 Almanac

- Department of Homeland Security Established
- Euro adopted by the EU
- Enron collapses
- U.S. invades Iraq
Evolution of HIV Tests

- 1\textsuperscript{st} generation: whole viral lysate, detects IgG antibody
- 2\textsuperscript{nd} generation: synthetic peptides, detects IgG antibody
- 3\textsuperscript{rd} generation: detect IgM and IgG antibody
Bio-Rad GS HIV-1/2 PLUS O
2003

Unigold Recombigen
2003

Siemens Advia Centaur
2006

Ortho Vitros
2008

3rd Generation
On-board Refrigeration of Multiple Different Assays

Random Access Multiplatform analyzers for HIV testing
Random Access Multiplatform analyzers for HIV testing

STAT sample requests without pausing
Results in < 60 minutes
Evolution of HIV Tests

- **1\textsuperscript{st} generation:** whole viral lysate, detects IgG antibody

- **2\textsuperscript{nd} generation:** synthetic peptides, detects IgG antibody

- **3\textsuperscript{rd} generation:** detect IgM and IgG antibody

- **4\textsuperscript{th} generation:** detects IgM, IgG antibodies, p24 antigen
Abbott Architect Ag/Ab Combo
2010

Bio-Rad Ag/Ab Combo
2011

Control

Antigen

Antibody

4th Generation

Determine Combo Ag/Ab Rapid Test
2013
Limitations of the 1989 Algorithm

- Antibody tests do not detect infection in ~ 10% of infected persons at highest risk of transmission

- Western blot confirmation is less sensitive during early infection than many widely used screening tests

- Western blot misclassifies as HIV-1 > 60% of HIV-2 infections
Relative Seroconversion Sensitivity (Plasma)

- 26 seroconverters were analyzed with 14 tests
- 17 seroconverters with WB positive used for cumulative frequency analysis
Sequence of Test Positivity Relative to WB (plasma)

166 specimens, 17 Seroconverters - 50% Positive Cumulative Frequency

Why Does It Matter?

- Sensitivity among frequently-tested MSM in Seattle

- 192 infected with HIV
  - 23 (12%) detected only by RNA
    - (15/16 tested detected by Ag/Ab immunoassay)
  - 169 (88%) detected by serum Ab immunoassay
  - 153 (80%) detected by oral fluid rapid test

- Stekler et al, Clin Inf Dis 2009
HIV-2 Infection

- Remains uncommon in U.S., but
  - Does not respond to NNRTIs, some PIs (first line therapy)
  - Undetectable by HIV-1 viral load tests

- Misclassification by HIV-1 Western blot:
  - 54/58 (93%) HIV-2 patients tested had positive HIV-1 WB (NYC)*
  - 97/163 (60%) HIV-2 cases reported had positive HIV-1 WB (CDC)**

- HIV-2 often diagnosed after immunologic deterioration in patient with negative viral load

* Torian et al, Clinical Infectious Disease 2010
** MMWR July 2011
Laboratory Testing for the Diagnosis of HIV Infection

Updated Recommendations

Published June 27, 2014

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Michael A. Pentella, PhD

Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
HIV-1/2 Combination Ag/Ab immunoassay

(+)

(-) or indeterminate

Negative for HIV-1 and HIV-2 antibodies and p24 Ag

HIV-1/HIV-2 antibody differentiation immunoassay

HIV-1 (+) HIV-1 (-)
HIV-2 (-) HIV-2 (+)

HIV-1 antibodies detected HIV-2 antibodies detected

HIV-1 (+) HIV-1 (-)
HIV-2 (+) HIV-2 (-)

HIV antibodies detected

NAT (+) NAT (-)

Acute HIV-1 infection Negative for HIV-1

NAT (+) NAT (-)

Available at: http://stacks.cdc.gov/view/cdc/23447
Laboratory testing to identify HCV infection

- **HCV ANTIBODY**
  - **NON-REACTIVE**
    - No HCV infection
    - **STOP**
  - **REACTIVE**
    - **HCV RNA**
      - **POSITIVE**
        - Current HCV Infection
        - **LINK TO CARE**
      - **NEGATIVE**
        - No current HCV Infection
        - Additional testing as appropriate
Nucleic Acid Test (NAT) for Diagnosis

- APTIMA HIV-1 qualitative RNA assay is only NAT FDA-approved for diagnosis

- Viral load tests: Clinicians can order them, but labs cannot use them as a reflex part of the algorithm
HIV Infection and Laboratory Markers

HIV RNA (plasma)

HIV p24 Ag

HIV Antibody

Days

Acute HIV: Risk of Sexual Transmission

HIV RNA in Semen (Log₁₀ copies/ml)

- 5
- 4
- 3
- 2

Acute Infection: 6 wks

- 1/30-1/200

Asymptomatic Infection

- 1/1000 - 1/10,000

HIV Progression

- 1/500 - 1/2000

AIDS

- 1/100-1/1000

Virus 75-750 times more infectious

Transmission Rate by Stage of Infection

Transmitting rate

$\beta_p = 2.8$

$\beta = 0.1$

$\beta_A = 0.6$

Primary

Asymptomatic

Pre-death

Hollingsworth et al, JD 2008
Phoenix ED Screening July 2011 through February 2013

- 4th gen screening of patients who had blood drawn
  - 15% of patients declined testing
  - 13,014 patients tested
  - 37 (0.3%) new HIV infections
    - 12 (32.4%) had Acute HIV Infection (antibody negative)

- Median viral load:
  - Patients with acute infections: 6 million
  - Patients with established infections: 25,000

-MMWR June 21, 2013
Acute HIV: Partner Notification

- Persons with acute HIV infection named
  - 2.5 times as many sex partners
  - 1.9 times as many partners newly diagnosed with HIV

...as did persons with new diagnosis of established HIV infection

Moore et al, JAIDS 2009
FDA-approved HIV-1/HIV-2 Antibody Differentiation Assay
Major change with new algorithm:
Continue beyond IgG serology

Days before WB positive

APTIMA (-26)
Architect Ag/Ab Combo (-20)
Bio-Rad Ag/Ab Combo (-19)
Advia (-14)
Vitros (-13)
GS 1/2+0 (-12)
Multi-Spot (-7)

25 20 15 10 5 0

WB positive
Where’s My Western Blot?

What HIV Specialists Need to Know about Updated HIV Testing Recommendations
The Geenius HIV-1/2 Cassette

Dual Path Platform (DPP™) licensed from CHEMBIO Diagnostic Systems, Inc.

- Whole blood, finger-stick, serum plasma
- FDA-approved October 24, 2014
- CLIA moderate complexity; potential for waiver
Dual Path Platform

- Conjugate
- Specimen

Buffer
Sample + Buffer
ID
TC
DPP®
CHEMBO
The Geenius™ HIV-1/2 Lines

HIV-1 & HIV-2 Associated Lines
The Geenius Reader

- Automated reading and interpretation
- No visual reading
- Automatic Calibration
- LIS Connectivity
- USB connection to laptop computer containing Geenius software (provided)
The Geenius Software

- Automated reading and validated results generation
- Pre-programmed and validated assay validity criteria
- Archiving of test results including a picture of each cassette
The Geenius HIV-1/2 Cassette: Assay Controls

- Built-in assay Control Line to demonstrate assay validity
- HIV Negative Control and combined HIV-1/2 Positive Control
- Fingerstick whole blood, serum, plasma
- Performed in 15 minutes

**Negative Control**

**Positive Control**
EDWARD R. ROYBAL
INFECTIOUS DISEASE
LABORATORY
HIV RNA (plasma)

HIV p24 Ag

HIV Ab

Eclipse Period

Acute Infection

Recent Infection

Longstanding Infection

Viral Detection

Antibody Detection 3rd generation EIA

Antibody Detection 2nd generation EIA

Antibody Detection 1st generation EIA

Seroconversion window

Days

0 10 20 30 40 50 60 70 80 180 240 300 360
Persons with HIV and Awareness of HIV Status, United States - 2011

Number HIV infected 1,144,500

Number unaware of their HIV infection 180,831 (18%)

Estimated new infections annually 47,500

HIV Surveillance Supplemental Report, 2013
Burden of HCV Infection and Disease

- United States
  - ~3.2 M (2.7-3.9) persons living with chronic HCV
  - 16,000 deaths/year

- CDC. MMWR, 2012
HCV in the Context of HIV in the US

- HCV: 3.2 million
- HIV: 1.1 million
HIV and HCV Co-infection

- Prevalence of co-infection varies by region
  - 25% of HIV infected persons in US

- HIV hastens progression of HCV related liver disease

- Liver disease is second leading cause of death for persons with HIV

Mortality associated with Hepatitis B, Hepatitis C, and HIV, United States, 1999 – 2008

The number of people living with HIV has grown because incidence is relatively stable and survival has increased.

Hall JAMA 2008; PreJean PloS One 2011; MMWR 2011
HCV Prevalence Among Persons Born 1920-1980

Terminology

- **Targeted testing:** performing a test on subpopulations of persons at higher risk based on behavioral, clinical or demographic characteristics

- **Screening:** performing a test for all persons in a defined population
Criteria that Justify Routine Screening

1. Serious health disorder that can be detected before symptoms develop
2. Treatment is more beneficial when begun before symptoms develop
3. Reliable, inexpensive, acceptable screening test
4. Costs of screening are reasonable in relation to anticipated benefits
5. Treatment must be accessible

*Principles and Practice of Screening for Disease*
*WHO Public Health Paper, 1968*
Limited Effectiveness of Risk-based HCV Testing Strategies

- Prior CDC recommendations:
  - Injection drug use
  - Blood transfusion before 1992 and other blood exposures
  - Many clinicians are not aware of HCV testing guidelines

- Clinicians may be reluctant to ask about risks
- Patients may be reluctant to disclose or may not recall risks
- 45-85% are unaware of their HCV infection
Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings
Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965
US Preventive Services Task Force

2013 Recommendation for HIV screening:
- All pregnant women - Grade A
- Persons at increased risk for HIV – Grade A
- Adolescents and adults ages 15 to 65 years – Grade A

2013 Recommendation for HCV screening
- Persons at increased risk:  Grade B
- Persons born between 1945-1965: Grade B
Screening: Cervical Cancer

Cervical CA

Annual new cases: 11,270
Deaths: 4,070
### Screening: Cervical Cancer vs. HIV

<table>
<thead>
<tr>
<th></th>
<th>HIV</th>
<th>Cervical CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual new cases</td>
<td>50,000</td>
<td>11,270</td>
</tr>
<tr>
<td>Deaths</td>
<td>15,564</td>
<td>4,070</td>
</tr>
</tbody>
</table>
Screening works.
Estimated Number of Perinatally Acquired AIDS Cases, by Year of Diagnosis, 1985-2005 – United States

- CDC HIV Screening Recs
- CDC HIV Screening Recs ~ 95% reduction
- PACTG 076 & USPHS ZDV Recs

Year of diagnosis

Number of cases
Future Burden of Hepatitis C Related Morbidity and Mortality in the US

- Markov model of health outcomes
  - Of 2.7 M HCV infected persons in primary care
    - 1.47 M will develop cirrhosis
    - 350,000 will develop liver cancer
    - 897,000 will die from HCV-related complications

1. The Medical Rationale

- Treatment is Effective.

- Treatment is recommended for everyone with HIV
  - *March 2012 – DHHS Treatment Guidelines*

- Treatment cures HCV
HIV Antiretroviral Therapy Improves Survival

Deaths per 100 PY


Patients on HAART

Deaths per 100 PY

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9

Mortality and HAART Use Over Time
HIV Outpatient Study, CDC, 1994-2003
Per-Person Survival Gains with Various Disease Interventions

- Walensky et al. JID, 2006
HCV Therapy Can Eliminate HCV Infection and Reduce Morbidity/Mortality Risks

- Therapy can cure HCV infection - sustained virologic response (SVR)

- SVR is associated with
  - 70% reduction in Hepatocellular carcinoma
  - 50% reduction in all-cause mortality

Advances in HCV Therapy

- 1991: IFN 6 m, 6%
- 1999: IFN 12 m, 16%; IFN/RBV 6 m, 34%
- 2001: IFN 12 m, 42%; Peg-IFN (PEG) 12 m, 39%
- 2002: Peg/RBV 12 m, 54 – 56%
- 2011: Peg/RBV DAA 6 m, 67-72%
- 2014: All oral DAA, >90%

2. Potential Effects on Transmission
Persons Whose HIV is Diagnosed Are Less Likely to Transmit

After people become aware they are HIV-positive, the prevalence of high-risk sexual behavior is reduced substantially.

Reduction in Unprotected Anal or Vaginal Intercourse with HIV-neg partners: HIV-pos Aware vs. HIV-pos Unaware 68%

Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the U.S Marks G, et al. JAIDS 2005;39:446
ART Stops HIV Transmission

Prevention of HIV-1 Infection with Early Antiretroviral Therapy

Myron S. Cohen, M.D., Ying Q. Chen, Ph.D., Marybeth McCauley, M.P.H.,
Theresa Gamble, Ph.D., Mina C. Hosseinipour, M.D.,
Nagalingeswaran Kumarasamy, M.B., B.S., James G. Hakim, M.D.,
Johnstone Kumwenda, F.R.C.P., Beatriz Grinsztejn, M.D., Jose H.S. Pilotto, M.D.,
Sheela V. Godbole, M.D., Sanjay Mehendale, M.D., Suwat Chariyalertsak, M.D.,
Breno R. Santos, M.D., Kenneth H. Mayer, M.D., Irving F. Hoffman, P.A.,
Susan H. Eshleman, M.D., Estelle Piwowar-Manning, M.T., Lei Wang, Ph.D.,
Joseph Makhema, F.R.C.P., Lisa A. Mills, M.D., Guy de Bruyn, M.B., B.Ch.,
Ian Sanne, M.B., B.Ch., Joseph Eron, M.D., Joel Gallant, M.D.,
Diane Havlir, M.D., Susan Swindells, M.B., B.S., Heather Ribaudo, Ph.D.,
Vanessa Elharrar, M.D., David Burns, M.D., Taha E. Taha, M.B., B.S.,
Karin Nielsen-Saines, M.D., David Celentano, Sc.D., Max Essex, D.V.M.,
and Thomas R. Fleming, Ph.D., for the HPTN 052 Study Team*
HPTN 052: HIV Transmissions

1,763 sero-diskordant couples (97% heterosexual)
HIV infected partners: 890 men, 873 women

39 HIV transmissions

28 linked HIV transmissions

11 unlinked transmissions

Immediate ART: 1 transmission

Deferred ART: 27 transmissions

96% reduction with ART

- Cohen M et al, NEJM 2011
Viral Suppression as Prevention

- To increase the % of persons with viral suppression in the U.S.:
  - Test
  - Link to care
  - Remain in care
  - Receive ART
  - Adhere to ART
The Percentage with Viral Suppression

- 80% HIV-infected
- 62% HIV-diagnosed
- 41% Linked to HIV care
- 36% Retained in HIV care
- 28% On ART
- 28% Suppressed viral load (≤ 200 copies/ml)
HCV Test, Care, and Treat Continuum

CDC CHeCS unpublished data; North et al Gen Hosp Psych 2012
THE GAY DIVIDE

Half the world has leapt forward...

...but too many countries are going backward.
Estimated Number of New HIV Infections by Transmission Category

- MSM
- Heterosexual
- IDU

Graph showing the estimated number of new HIV infections by transmission category from 1977 to 2006.
Estimated New HIV Infections in MSM 2010, by race/ethnicity and age group

HIV Incidence in Young MSM ages 13-24 years, 2007-2010

Number of MSM newly infected with HIV

Estimated Incidence of Acute Hepatitis C: United States, 1982 – 2009

Source: Sentinel Counties Study of Viral Hepatitis and State Disease Surveillance, CDC
Acute Infections in MSM detected by RNA only

- 0.3% of 14,005 frequently tested MSM in Seattle STD clinic; **20% of all HIV infections detected**
  - Stekler et al, Clin Infect Dis 2009

- 26 (74%) of 35 AHI cases detected in LA at MSM clinic; **25% of all HIV infections detected**
  - Patel et al, Archives Int Med 2010

- 0.08% of 21,425 STD clinic patients in New York City; **9% of all HIV infections detected**; 94% were MSM
  - Shepard et al, MMWR 2009
# Daily Oral Pre-exposure Prophylaxis (PrEP) Efficacy by Adherence

<table>
<thead>
<tr>
<th>Intervention</th>
<th>mITT</th>
<th>Drug detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSM (iPrEx, TDF/FTC)</td>
<td>44%</td>
<td>92%</td>
</tr>
<tr>
<td>Heterosexuals (Partners PrEP, TDF/FTC)</td>
<td>75%</td>
<td>90%</td>
</tr>
<tr>
<td>IDU (Bangkok Tenofovir Study, TDF)</td>
<td>49%</td>
<td>70%</td>
</tr>
</tbody>
</table>


Efficacy and Adherence Over Time

Activated drug (TVF) across multiple visits in Partners PrEP trial

% Relative risk reduction

-6.5  58.9  93.9  75.1

Never Measurable  Sometimes Measurable  Always Measurable  Overall

TVF level
Clinical Practice Guideline

- Review of efficacy and safety evidence
- Identifying patients with
  - Indications for PrEP
  - Contraindications for PrEP
- Prescribing, laboratory testing, and follow-up care
- Supporting adherence and risk reduction

Indications for PrEP

- Brief sexual history
  - Sex with men, women, or both?
  - Consistent condom use?
  - Number and HIV status of sex partners
  - Recent STIs?

- Brief drug use history
  - Injection drug use?
  - Drug treatment

- Most recent potential HIV exposure
Contraindications

- HIV infection
- Recent signs/symptoms of acute viral illness
- Renal or bone disease
Initial laboratory testing

- HIV test
- Creatinine
- Hepatitis B (if unvaccinated)
- Pregnancy test
- STI testing (including extragenital for MSM)
PrEP Follow-up Visits

- HIV test every 3 months
- Creatinine at 3 months, then every 6 months
- Pregnancy test every 3 months
- STI tests every 6 months if asymptomatic
- Assess
  - Medication adherence
  - HIV risk and protective behaviors
PrEP works if you take it (in community settings)

**iPrEx Open Label Extension Study (MSM)**

<table>
<thead>
<tr>
<th>Adherence by Drug Concentration</th>
<th>HIV Incidence per 100 PY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 pills/week</td>
<td>4.7</td>
</tr>
<tr>
<td>&lt; 2 pills/week</td>
<td>2.3</td>
</tr>
<tr>
<td>2-3 pills/week</td>
<td>0.6</td>
</tr>
<tr>
<td>≥4 pills/week</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**STD clinics (MSM)**

- Miami: 57%
- DC: 78%
- SF: 92%
- All sites: 77%

Percent Compliant Based on Blood Levels

4 or more doses per week
Adherence Matters

- Daily PrEP provides high levels of protection if taken consistently.
- PrEP has some “forgiveness” if occasional doses are missed.
- No evidence PrEP is effective when taken sporadically or intermittently.
Potential Impact of PrEP for MSM in New York City

SMOKEY'S A-B-C's

A - Abstinence
B - Be faithful
C - Condoms

PReP!
can prevent forest fires
Polio Eradication

1988:
- Countries that have never eliminated polio
- Countries that have eliminated polio

2014*:
- Countries that have never eliminated polio
- Countries that have eliminated polio

*As of April 29, 2014
Tell It Like It Is.

- Epidemic is over.
  - No matter what the Communications people say.

- Prevention versus Care and Treatment?
  - Prevention Goal: 0 new transmissions
  - Treatment Goal: 0 new cases of AIDS

- “AIDS-free generation”
  - Use the tools we have
  - Use the techniques that worked before
  - Start young
the end