AIDS 2012 XIX International AIDS Conference
July 22-27, 2012
Washington, DC, USA

Report Back to the SFDPH
Health Commission
August 21, 2012
Agenda

• **Diane Havlir, MD**
  US Co-Chair of AIDS 2012
  Professor of Medicine, Chief of HIV/AIDS Division
  University of California, San Francisco General Hospital

• **Susan Scheer, PhD, MPH**
  Director of HIV Epidemiology
  Population Health and Prevention, SFDPH

• **Albert Liu, MD, MPH**
  Director of HIV Prevention Intervention Studies
  Bridge HIV
  Population Health and Prevention, SFDPH

• **Tracey Packer, MPH**
  Acting Director of HIV Prevention
  HIV Prevention Section
  Population Health and Prevention, SFDPH
The Beginning of ...
The Scientific Foundation

• Key scientific advances
  – Treatment as Prevention
  – Pre-Exposure Prophylaxis (PREP)
  – Adult male circumcision
  – Evidence for HIV cure
  – Insights into vaccine efficacy
HIV PREVENTION

Structural / legal

Male & female condoms

Male circumcision

HIV Counselling and Testing

Coates T, Lancet 2000

Auvert B, PloS Med 2005

Gray R, Lancet 2007

Bailey R, Lancet 2007

Antiretroviral Treatment

Cohen M, NEJM 2011

Donnell D, Lancet 2010

Grant R, NEJM 2010 (MSM)

Baeten J, NEJM 2012 (couples)

Thigpen, NEJM, 2012 (Heterosexuals)

Oral pre-exposure prophylaxis (PREP)

Scheckter M, 2002

Grant R, NEJM 2010 (MSM)

Microbicides for women

Abdool Karim Q, Science 2010

Post Exposure prophylaxis (PEP)

Scheckter M, 2002

Evidenced Based Combination Prevention
Challenge: PREP requires Adherence

<table>
<thead>
<tr>
<th>STUDY</th>
<th>% of blood samples with tenofovir detected</th>
<th>HIV protection efficacy in randomized comparison</th>
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<td>Partners PrEP FTC/TDF arm</td>
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<td>TDF2</td>
<td>79%</td>
<td>62%</td>
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<td>iPrEx</td>
<td>51%</td>
<td>44%</td>
</tr>
<tr>
<td>FEM-PrEP</td>
<td>26%</td>
<td>6%</td>
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There is a clear dose-response between evidence of PrEP use & efficacy
Challenge: Treatment requires a functional “Cascade of Care”

In the United States:

- Out of the more than one million Americans with HIV:
  - 80% know they are infected
  - 62% were linked to HIV care
  - 41% have stayed in HIV care
  - 36% are receiving treatment
  - 28% have a very low amount of virus in their bodies
Challenge: HIV Cure

Steve Deeks and Francoise Barre Sinousi,
HIV Cure pre-Meeting
Key High Level Policy

• Secretary Clinton – continued USG investment
• Secretary Sibelius - support for the US epidemic
• US Congress – Bipartisan support for US/global response
• Head of UN, World Bank, WHO all gave commitments to the AIDS response
Financing the Global Response

“Pay now - or pay forever”

2015 gap: US$ 7 billion

HIV investment US$ (billions)

New HIV infections (millions)


Schwartländer et al. Lancet 2011
Those that say it can’t be done should get out of the way of those doing it.

*Chinese Proverb*
In this era of ‘test and treat’ surveillance data are used as indictors of testing, engagement in care, and personal and public health outcomes.

Presentations by the HIV Epidemiology Section focused on this theme.

We demonstrate the application of surveillance data to the emerging theme of treatment for reducing morbidity, mortality, and transmission.
National Spectrum of Engagement in HIV care
The Gardner Cascade

Only 19% of estimated 1.1 million of HIV+ Americans

Gardner et al, CID 2010
Trends in Antiretroviral Treatment Initiation Among Persons Diagnosed with HIV in San Francisco, 2004-2010

Ling Hsu, Eric Vittinghoff, Susan Scheer, Sandra Schwarcz
Trends in Antiretroviral Treatment Initiation Among Persons Diagnosed with HIV in San Francisco, 2004-2010

Figure 1: Kaplan-Meier time to ART initiation by year of HIV diagnosis
## Trends in Antiretroviral Treatment Initiation Among Persons Diagnosed with HIV in San Francisco, 2004-2010

<table>
<thead>
<tr>
<th></th>
<th>Number (%)</th>
<th>Median months from HIV to ART</th>
<th>Wilcoxon p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>3768 (100)</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2010 (53)</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td><strong>African American</strong></td>
<td>542 (15)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Latino</td>
<td>794 (21)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>276 (7)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>146 (4)</td>
<td>27</td>
<td>0.0010</td>
</tr>
<tr>
<td><strong>HIV risk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM</td>
<td>2610 (69)</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>IDU</td>
<td>276 (7)</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td><strong>MSM and IDU</strong></td>
<td>543 (15)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>198 (5)</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>141 (4)</td>
<td>14</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>784 (21)</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>1473 (39)</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td><strong>None</strong></td>
<td>1209 (32)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>302 (8)</td>
<td>37</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Trends in Antiretroviral Treatment Initiation Among Persons Diagnosed with HIV in San Francisco, 2004-2010

Figure 2: Median CD4 count at ART initiation among persons with CD4 >350 at time of HIV diagnosis

<table>
<thead>
<tr>
<th>Year of HIV Diagnosis</th>
<th>CD4 at ART (cells/mm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>365</td>
</tr>
<tr>
<td>2005</td>
<td>383</td>
</tr>
<tr>
<td>2006</td>
<td>376</td>
</tr>
<tr>
<td>2007</td>
<td>405</td>
</tr>
<tr>
<td>2008</td>
<td>439</td>
</tr>
<tr>
<td>2009</td>
<td>484</td>
</tr>
<tr>
<td>2010</td>
<td>515</td>
</tr>
</tbody>
</table>
Using HIV/AIDS Surveillance Data to Evaluate if a HIV Test-and-Treat Strategy Leads to Viral Suppression; San Francisco, California, USA

Ling Hsu, Sharon Pipkin, Jennie Chin, Sandra Schwarcz, Susan Scheer
<table>
<thead>
<tr>
<th>HIV cases diagnosed 2008-2010</th>
<th>Number (Column %)</th>
<th>Number and percent [row %] of cases with viral suppression within 12 months after linkage to care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linked to care 0-3 months after HIV</td>
<td>1072 (83%)</td>
<td>589 [55%]</td>
</tr>
<tr>
<td>Linked to care 4-12 months after HIV</td>
<td>83 (7%)</td>
<td>38 [46%]</td>
</tr>
<tr>
<td>Linked to care &gt;12 months after HIV or no care</td>
<td>130 (10%)</td>
<td>22 [17%]</td>
</tr>
</tbody>
</table>
Using HIV/AIDS Surveillance Data to Evaluate if a HIV Test-and-Treat Strategy Leads to Viral Suppression; San Francisco, California, USA

Table 3: Living HIV/AIDS cases as of 12/31/2010 by engagement in HIV care and HIV viral suppression

<table>
<thead>
<tr>
<th>Living HIV/AIDS cases as of 12/31/2010</th>
<th>Number (Column %)</th>
<th>Number and percent [row %] of living cases with viral suppression in 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent care, ≥2 tests in 2010</td>
<td>8902 (58%)</td>
<td>7823 [88%]</td>
</tr>
<tr>
<td>Intermittent care, 1 test in 2010</td>
<td>2208 (14%)</td>
<td>1374 [62%]</td>
</tr>
<tr>
<td>No care, 0 test in 2010</td>
<td>4140 (27%)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Estimating HIV Incidence in California, United States, 2006-2009

Susan Scheer¹, Shoshanna Nakelsky², Trista Bingham ², Mark Damesyn³, Dan Sun³, Jennie Chin¹, Anthony Buckman¹, Karen Mark³

¹ San Francisco Department of Public Health, San Francisco, CA, USA
² Division of HIV and STD Programs, Los Angeles County Department of Public Health, Los Angeles, CA, USA
³ Office of AIDS, California Department of Public Health, Sacramento, CA, USA
Figure: Estimated number of new HIV infections by year, San Francisco

Estimating HIV Incidence in California, United States, 2006-2009
# Estimated rate of new HIV infections by race/ethnicity, age group and mode of transmission
## San Francisco 2006-2009

<table>
<thead>
<tr>
<th></th>
<th>2006 Rate per 100,000 (95% CI)</th>
<th>2007 Rate per 100,000 (95% CI)</th>
<th>2008 Rate per 100,000 (95% CI)</th>
<th>2009 Rate per 100,000 (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex at Birth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>128 (94-173)</td>
<td>125 (84-166)</td>
<td>123 (90-155)</td>
<td>98 (69-128)</td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>86 (55-118)</td>
<td>85 (5-119)</td>
<td>75 (50-99)</td>
<td>55 (36-74)</td>
</tr>
<tr>
<td>Black</td>
<td>** **</td>
<td>** **</td>
<td>117 (38-199)</td>
<td>181 (0-375)</td>
</tr>
<tr>
<td>Latino</td>
<td>68 (28-109)</td>
<td>102 (28-178)</td>
<td>148 (61-233)</td>
<td>68 (26-110)</td>
</tr>
<tr>
<td><strong>Age at Infection (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-29</td>
<td>79 (45-114 )</td>
<td>118 (57-179 )</td>
<td>97 (55-138 )</td>
<td>80 (45-115 )</td>
</tr>
<tr>
<td>30-39</td>
<td>84 (48-120 )</td>
<td>85 (51-120 )</td>
<td>88 (55-121 )</td>
<td>70 (34-107 )</td>
</tr>
<tr>
<td>40+</td>
<td>59 (26-93 )</td>
<td>44 (18-70 )</td>
<td>42 (25-59 )</td>
<td>34 (19-49 )</td>
</tr>
<tr>
<td><strong>Mode of Transmission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM¹</td>
<td>807 (536-1078 )</td>
<td>783 (517-1047 )</td>
<td>788 (579-998 )</td>
<td>626 (450-800)</td>
</tr>
</tbody>
</table>

** Incidence estimate not calculated due to few new diagnoses and BED test results in these populations

1 MSM includes MSM-IDU
Linkage, Access, ART Use and Viral Suppression in Four Large Cities in the United States, 2009

N. Benbow\textsuperscript{1}, S. Scheer\textsuperscript{2}, A. Wohl\textsuperscript{3}, K. Brady\textsuperscript{4}, A. Gagner\textsuperscript{1}, A. Hughes\textsuperscript{2}, J. Tejero\textsuperscript{3}, M. Eberhart\textsuperscript{4}, V. Hu\textsuperscript{3}, S. Townsell\textsuperscript{1}

\textsuperscript{1}Chicago Department of Public Health, STI/HIV Division - Surveillance, Epidemiology and Research Section, Chicago, United States
\textsuperscript{2}San Francisco Department of Public Health, San Francisco, United States
\textsuperscript{3}Los Angeles County Department of Public Health, Los Angeles, United States,
\textsuperscript{4}Philadelphia Department of Public Health, Philadelphia, United States
Figure 1: Percentage of estimated number of HIV-infected persons* in stages of continuum of HIV care in four large United States cities through December 2009

- Linked to Care
- Accessed Care
- On ART
- Suppressed viral load

* Includes people diagnosed with HIV in 2008 and living with HIV through 2009 and an estimated additional 20% who are unaware of their infection.
HIV Prevention Highlights: AIDS 2012

- Albert Liu, MD, MPH
  Jonathan Fuchs, MD, MPH

- SFDPH Health Commission Meeting
  - August 21, 2012
Estimated New HIV Infections in the U.S., 2009, for the Most-Affected Subpopulations*

Gay and bisexual men of all races and black heterosexuals account for the greatest number of new HIV infections in the United States.

(Prejean et al., 2011)
HPTN 061: HIV Incidence in Black MSM

- Longitudinal study of the feasibility and acceptability of a multi-component intervention for Black MSM in 6 US cities (SF, LA, NYC, Boston, Atlanta, DC)
- 12% newly diagnosed at baseline
- 1,009 HIV-negative followed for HIV testing:
  - 38% ≤ age 30, 46% with some college education or more

<table>
<thead>
<tr>
<th>Baseline characteristic</th>
<th>No. of infections</th>
<th>Person-years</th>
<th>Incidence (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>928.2</td>
<td>2.8 (1.8, 4.1)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>20</td>
<td>339.7</td>
<td>5.9 (3.6, 9.1)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>6</td>
<td>588.5</td>
<td>1.0 (0.4, 2.2)</td>
</tr>
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</table>

- Targeted, tailored, and culturally appropriate combination HIV prevention strategies are urgently needed

Adapted from Mayer, Koblin AIDS 2012, MOAC0105, MOAC0106
Disparities persist between black and other MSM throughout treatment cascade

- Undiagnosed HIV, OR 6.38 (4.33-9.39)
- Diagnosed HIV+, OR 3.00 (2.06-4.40)
- >200 CD4 cells/mm³ before ART initiation, OR 0.40 (0.26-0.62)
- ART adherence, OR 0.50 (0.33-0.76)
- ART utilization/access, OR 0.56 (0.41-0.76)
- HIV suppression, OR 0.51 (0.31-0.83)
- Viral Suppression

Millett AIDS 2012, Lancet 2012
Diagnosed HIV+ OR, 3.00 (2.06-4.40)

Undiagnosed HIV OR, 6.38 (4.33-9.39)

Health insurance coverage OR, 0.47 (0.29-0.77)

 ART adherence OR, 0.50 (0.33-0.76)

HIV suppression OR, 0.51 (0.31-0.83)

ART utilization/access OR, 0.56 (0.41-0.76)

>200 CD4 cells/mm³ before ART initiation OR, 0.40 (0.26-0.62)

Lower income <$20k OR, 3.42 (1.94-6.01)

Healthcare visits OR, 0.61 (0.42-0.90)

Viral Suppression
FDA Panel Recommends Anti-HIV Drug for Prevention

USA FDA reviewed and approved a label indication for emtricitabine/tenofovir (Truvada®) for HIV prevention on July 16th 2012

We now have a powerful tool, that can safely be used by populations of vulnerable HIV-negative individuals
PrEP (like ART) works when taken

<table>
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<th>Study/PrEP</th>
<th>% of blood samples with tenofovir detected</th>
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There is a clear dose-response between evidence of PrEP use & efficacy

Grant et al N Engl J Med 2010

Mugo AIDS 2012
## PrEP knowledge, acceptability, and potential for risk compensation

<table>
<thead>
<tr>
<th>Author/Population</th>
<th>Year</th>
<th>PrEP Knowledge</th>
<th>PrEP Acceptability</th>
<th>Risk compensation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metsch et al 653 MSM in Miami, DC</td>
<td>2011</td>
<td>15% Miami</td>
<td>48% Miami</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30% DC</td>
<td>61% DC</td>
<td></td>
</tr>
<tr>
<td>Duffus et al 89 seronegative partners in SD couple in South Carolina (74% heterosexual)</td>
<td>2010-2011</td>
<td>--</td>
<td>94%</td>
<td>26% would be more likely to have unprotected sex with HIV+ partner, 27% reported would be difficult to take a daily pill</td>
</tr>
<tr>
<td>Krakower et al. Internet-based survey of 5035 MSM in North America</td>
<td>Dec 2010-Jan 2011</td>
<td>19%</td>
<td>50%</td>
<td>A substantial minority of MSM anticipate risk compensation for insertive (20%) or receptive (14%) anal sex while using PrEP</td>
</tr>
</tbody>
</table>
Why do we need PrEP demonstration projects?

- Will MSM want PrEP?
- How will MSM use PrEP?
- How will sexual practices change?
- Where are PrEP delivery systems best located?
- Will PrEP be safe in the “real world”?

Cohen AIDS 2012
PrEP Demonstration Project

- NIAID-funded Demonstration Project
- 500 at-risk HIV-negative MSM and trans women in STD clinics
- Offered up to 12 months of PrEP (FTC/TDF)

Objectives:
- Acceptability, uptake
- Safety
- Adherence
- Risk practices
- Deliverability
- Best practices

Project to launch Sept 2012

San Francisco City Clinic (N=300)

Miami-Dade County Downtown STD clinic (N=200)
EPIC (Enhancing PrEP in Community Settings)

• NIMH-sponsored R01 (Liu/Fuchs)
  – Evaluate PrEP adherence in PrEP demo project
    • Dried blood spots, hair
  – Develop and evaluate novel adherence strategies to support PrEP
Rapid H.I.V. Home Test Wins Federal Approval

By DONALD G. McNEIL Jr.
Published: July 3, 2012

After decades of controversy, the Food and Drug Administration approved a new H.I.V. test on Tuesday that for the first time makes it possible for Americans to learn in the privacy of their homes whether they are infected.
Home HIV rapid test to screen sexual partners in MSM in NYC

- 27 high risk MSM in NYC enrolled and provided HIV rapid test kits
- 101/124 partners agreed to testing
- 10 tested individuals had positive results
  - 7 were prospective partners,
    3 acquaintances
  - 6 were unaware of positive status
- No unprotected sex occurred with these partners
- Home HIV test highly acceptable, some reported shifted perceptions of risk and change in risk practices

Carballo-Dieguez AIDS 2012
• NIH-sponsored R01 (Buchbinder)
  – Increase HIV testing and linkage to care among African American and Latino MSM through home HIV testing

• 3 study phases
  – Understand barriers/facilitators of home HIV testing and linkage to care
  – Develop intervention package
    • Buddies, peer health navigators, online/SMS strategies
  – Test package in young MSM of color in Oakland and SF
Ongoing HVTN 505 Vaccine Efficacy Trial

- Optimism in the field as RV144 showed that vaccine combination reduced HIV infection by 31%

- Vaccine Research Center’s DNA prime/ Ad5 boost in phase 2
  - Multi-gene, multi-clade vaccine regimen

- 2500 MSM and trans women from sites in the US
  - 18-50 years of age
  - Sexually active, HIV negative
  - 2 years of follow-up

- Approximately 2100 enrolled to date
  - Interim efficacy analysis anticipated in 2013
San Francisco’s Approach to Maximizing the Continuum of Prevention, Care and Treatment

- PrEP, PEP, condom distribution, syringe availability
- Address Drivers
  1. Alcohol
  2. Meth
  3. Crack/Cocaine
  4. Poppers
  5. STDs
  6. # of partners

SFDPH Linkage Integration Navigation Comprehensive Services (LINCS)

Community – based and DPH Programs

Policy Initiatives, Structural Change, Research

HIV Incidence
Access/Health outcomes
Disparities

Community Testing
↑ Routine Medical Testing
↑ Linkage & Partner Services

↑ Testing

Diagnosis
Linkage

Primary Care
Engagement / Retention

↑ Treatment

Virologic Suppression

Mental Health Services
Substance Use Treatment
Housing Support

Treatment Adherence
Medical Case Management
ART Guidelines Uptake
STD & PCSI
Engagement & Partner Services
Special Projects Addressing HIV Health Disparities

Holistic approach to HIV prevention using a combination of services designed to meet the specific needs of these populations.

Program goals include:

- Promoting status awareness
- Providing information, resources, and support to stay negative;
- Supporting initial linkage to primary care, partner services, and ancillary services for newly HIV-positive people; and
- Supporting people living with HIV to fully engage in care.

Reaching:

- African American gay men
- Latino gay men
- Gay men of all races/ethnicities
- Transfemales
Recommendations to end AIDS in San Francisco

• Support initiatives to increase HIV testing
  – Strategies to promote standard testing and optimize home HIV testing.
  – Increase frequency of testing among high prevalence groups to every 3-6 months.
  – Ensure routine HIV testing in medical settings is truly routine.
  – Partner services is routine.

• Reduce HIV disparities
  – Need to develop and test interventions to address both individual and structural factors.
  – Strengthen outreach and services to most affected populations.
Recommendations to end AIDS in San Francisco

- **Ensure quality of care and treatment for all.**
  - Anticipate changes in health delivery landscape and plan for the entry of more patients into care.
  - Support integration of prevention and treatment and strengthening of care cascade through current and new partnerships.
  - Broaden uptake of universal treatment guidelines.
  - Ensure adequate funding for the continuum of prevention, care, and treatment.
Recommendations to end AIDS in San Francisco

• **Invest in workforce development**
  – Address gaps at various stages of the treatment and prevention cascade.

• **Promote scalable technology**
  – May enhance access to care, prevention messaging, adherence
  – Optimize data system coordination and integration across public health and clinical systems.

• *If we maximize steps along the cascade--we can truly turn the tide and end of AIDS.*