Overview of Presentation

- Is the HIV/AIDS epidemic over in the US?
- Does HIV prevention work at the national level in the US?
- What is the status of the set of goals from the current (albeit expired) national HIV prevention plan?
- What might a new comprehensive national HIV prevention plan look like?
  - Which evidence-based prevention strategies should we emphasize in the next national plan?
  - How does opt-out HIV testing fit into that plan?
Modeling HIV Prevention Effectiveness: What Happened and What Would Have Happened Without Prevention Services in Place?

Note: *Best available* estimate of annual HIV incidence since early 1990s is 40,000 infections per year.
Modeling the Effectiveness and Efficiency of Overall National Response to HIV in the US

<table>
<thead>
<tr>
<th>Modeling Scenario (without prevention, national HIV incidence may have...)</th>
<th>Estimated HIV Infections Averted (1985-2000)</th>
<th>Gross Cost per Infection Averted</th>
<th>Net Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stayed flat after peak at 161,000 infections per year</td>
<td>1,585,000</td>
<td>$6,400</td>
<td>Cost-saving</td>
</tr>
<tr>
<td>Declined (after peak), then flattened at 123,000 infections per year</td>
<td>1,031,000</td>
<td>$9,800</td>
<td>Cost-saving</td>
</tr>
<tr>
<td>Declined (after peak) at 6% per year</td>
<td>672,000</td>
<td>$15,100</td>
<td>Cost-saving</td>
</tr>
<tr>
<td>Declined (after peak) at 12% per year until flat at 40,000 infections per yr.</td>
<td>204,000</td>
<td>$49,700</td>
<td>Cost-saving</td>
</tr>
</tbody>
</table>

Estimated HIV Transmission Rate (as percentage of PLWH/A) in the US, 1985-2000

Refining Transmission Rates by Knowledge of Serostatus$^{1-3}$

- Unaware of HIV seropositivity
  - Transmission rate estimated at 8.8 to 10.8%
- Aware of HIV seropositivity
  - Transmission rate estimated at 1.7 to 2.4%

Estimated Annual HIV Incidence, AIDS Deaths, and Expected AIDS Deaths Scenario
US, 1978-2002

CDC HIV Prevention Budget and Cost of Unmet Needs

- Adjusted for inflation, CDC’s HIV prevention budget decreased by 19.3% from FY02-07
- $171 million would be need to undo the damage of budget cuts, administrative budget realignment, and inflationary pressures
- On top of that, cost of unmet needs analyses would suggest a shortfall of another roughly $434 million
- Adding current budget, inflation adjustment and unmet needs estimates would indicate a needed budget of $1.321 billion
  - Note: $45 million in one-time funds from may have been “found” by CDC in FY07 inside of agency; source and precise use of funds still unclear
  - Holtgrave, *Journal of Urban Health*, in press
CDC’s HIV Prevention Budget and Incidence: 1-Yr Lag Analysis of Annual Percentage Changes

Reduce the number of new HIV infections in the US from an estimated 40,000 to 20,000 per year by the year 2005, focusing particularly on eliminating racial and ethnic disparities in new HIV infections.

HIV/AIDS Diagnoses
33 States, 2001-2005

- 186,449 diagnoses in 5 years
- Average of 37,289 diagnoses per year
- 33 states account for 63% of AIDS cases
- Incidence usually greater than diagnoses (depends on many factors)
  - 186,449 in 5 years in 33 states might imply incidence well over 40,000 per year in US

First Subgoal from 2001 Plan

• “By 2005, decrease by at least 50% the number of persons in the US at high risk for acquiring or transmitting HIV infection by delivering targeted, sustained and evidence-based HIV prevention interventions”
Status of First Subgoal

- Exact status unclear due to format of subgoal and lack of data directly on-point
- HIV-positive persons reduce risk behavior by 68% after learning of HIV seropositivity¹
- About 11.7% to 11.9% of general population of US at heightened risk of HIV due to sexual or drug use risk behaviors (or current STD) according to 2002 NSFG²,³

Second Subgoal from 2001 Plan

- “By 2005, through voluntary counseling and testing, increase from the current estimated 70% to 95% the proportion of HIV-infected people in the US who know they are infected”

- Status
  - CDC now estimates 73 to 76% awareness level

Third Subgoal From 2001 Plan

• “By 2005, increase from the current estimated 50% to 80% the proportion of HIV-infected people in the US who are linked to appropriate care and treatment services”

• Status
  – IOM estimates 49.7% of persons in need of HAART receiving HAART

CDC’s “Quiet Launch” of May 2007
Addendum to National Plan

- Reduce new infections by 10% by 2010 (with emphasis on reducing health disparities)
- Increase awareness of seropositivity from 75% to 80% by 2010
- Increase from 50% to 65% by 2010 proportion of newly diagnosed PLWH who are linked to appropriate prevention, care and treatment services
- Purported cause of lowered expectations: limited resources
The “Next” National Goal: A more ambitious proposal

- In 3 (maximum 4) years, reduce new HIV infections in the US to 20,000 per year or less, paying particular attention to racial/ethnic health disparities
  - Over those years, annual progress toward the goal should be achieved in terms of
    - (a) national investment
    - (b) process measures (in terms of policy implementation, barrier reduction and service delivery), and
    - (c) annual outcomes assessment

Populations by HIV Serostatus and Behavioral Risk Level

General Population of U.S. (298M)

HIV- at Continued Risk (5M to 26.3M)

Unaware HIV+ (275K)

Aware HIV+; No Risk Beh. (693K)

Aware HIV+; Risk Beh. (132K)

Populations by HIV Serostatus and Behavioral Risk Level

General Population of U.S. (298M)

- HIV- at Continued Risk
- HIV+ Unaware
- HIV+ Aware; No Risk Beh.
- HIV+ Aware; Risk Beh.

Care/Tx

<table>
<thead>
<tr>
<th>Population</th>
<th>HIV Prevention Services</th>
</tr>
</thead>
</table>
| Tested HIV+    | • Intensive prevention services – esp. for minority of PLWH/A who don’t change behavior (note: science is unfolding)  
|                | • Linkages to medical care and treatment, STD, hepatitis, mental health, substance abuse, housing and social services as needed (note: care resource issues)  
|                | • Comprehensive case management  
|                | • Partner counseling and referral services  
|                | • Special efforts re: recent infections  
|                | • Structural interventions  
|                | (including efforts to reduce barriers to care)  
|                | • Perinatal transmission elimination effort |

Serostatus-specific HIV Prevention Update of SAFE Publication¹

<table>
<thead>
<tr>
<th>Population</th>
<th>HIV Prevention Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recently tested HIV-; continued behavioral risk of infection</td>
<td>• HIV counseling and testing (customized for persons testing repeatedly)</td>
</tr>
<tr>
<td></td>
<td>• Intensive individual or small group counseling</td>
</tr>
<tr>
<td></td>
<td>• Community-level interventions</td>
</tr>
<tr>
<td></td>
<td>• Linkages to STD, substance abuse, mental health, hepatitis, housing and social services as needed</td>
</tr>
<tr>
<td></td>
<td>• Prevention case management</td>
</tr>
<tr>
<td></td>
<td>• Structural interventions (including sterile syringe access)</td>
</tr>
</tbody>
</table>

### Serostatus-specific HIV Prevention Update of SAFE Publication¹

<table>
<thead>
<tr>
<th>Population</th>
<th>HIV Prevention Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unaware of serostatus</td>
<td>• Encourage HIV <strong>counseling and testing</strong> (utilizing best available testing methods) as appropriate for risk level</td>
</tr>
<tr>
<td>General population</td>
<td>• Provide <strong>current</strong>, essential HIV-related information (Over 40% of population misinformed about HIV)</td>
</tr>
<tr>
<td></td>
<td>• Reduce stigma of HIV disease and services (19 to 25% of general population holds stigmatizing attitudes; in UCLA Law School study, substantial numbers of health care providers prefer not to give care to PLWH/A)</td>
</tr>
</tbody>
</table>

Levels of HIV Prevention Interventions

- Individual
- Dyad
- Family
- Group
- Community
- Structural
  - laws and policies;
  - environment;
  - social determinants
Overview of HIV Prevention Interventions

- Sexual transmission
  - Small groups
  - Counseling & testing
  - Community-level
  - Structural-level
  - STI diagnosis and treatment

- Perinatal transmission
  - AZT; nevirapine
  - Breast-milk supplementation

- Parenteral transmission
  - Blood safety
  - Occupational setting precautions
  - IDU programs
    - Behavior change, drug treatment, access to sterile injection equipment

Effective Prevention Tools

- Teacher training and peer education
- Male and female condoms
- Condom promotion and social marketing
- Treatment of STIs
- Voluntary counseling and testing

- Workplace programs
- Transfusion screening
- Prevention of MTCT
- Mass media campaigns
- Harm reduction programs
- Peer counseling

Examples of Cost-saving HIV Prevention Interventions
(Other Interventions May Be Cost-effective)

<table>
<thead>
<tr>
<th>At-risk MSM</th>
<th>At-risk women</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-session group</td>
<td>Condom social marketing</td>
</tr>
<tr>
<td>12-session group</td>
<td>Outreach-based services</td>
</tr>
<tr>
<td>Peer-lead community-level</td>
<td>5-session group</td>
</tr>
<tr>
<td>At-risk MSW/M</td>
<td>Injection drug users</td>
</tr>
<tr>
<td>Video-based, 1-session intervention</td>
<td>Needle and syringe exchange</td>
</tr>
<tr>
<td>Condom social marketing</td>
<td>Multi-session group</td>
</tr>
<tr>
<td>Outreach-based services</td>
<td>Drug treatment</td>
</tr>
<tr>
<td>7-session group</td>
<td>STD clinic clients</td>
</tr>
<tr>
<td></td>
<td>HIV counseling and testing, referral and partner notification</td>
</tr>
</tbody>
</table>

Housing as a Kind of HIV Prevention Intervention

- Higher rates of HIV-related risk behavior among homeless and unstably housed\(^1\)
  - Major study underway (sponsored by HUD and CDC) to determine prospectively the impact of housing on HIV-related risk behaviors (Baltimore, Chicago, LA)
- Housing is related to detectability of viral load\(^2\)

### Social Determinants of STIs and AIDS Cases
#### US States, 1999

Pearson correlation coefficients across 48 states with available data, df = 46

<table>
<thead>
<tr>
<th></th>
<th>Gonorrhea</th>
<th>Syphilis</th>
<th>Chlamydia</th>
<th>AIDS Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>.204</td>
<td>.232</td>
<td>.358*</td>
<td>.099</td>
</tr>
<tr>
<td>Social Capital</td>
<td>-.671*</td>
<td>-.591*</td>
<td>-.532*</td>
<td>-.498*</td>
</tr>
<tr>
<td>Income Inequality</td>
<td>.203</td>
<td>.133</td>
<td>.395*</td>
<td>.469*</td>
</tr>
</tbody>
</table>

*P < .01

Results: Bivariate Linear Correlations Between Social Determinants and Teen Pregnancy Rates, 1999

Pearson correlation coefficients across 48 states with available data, df = 46

<table>
<thead>
<tr>
<th></th>
<th>Teen Pregnancy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>.44*</td>
</tr>
<tr>
<td>Social Capital</td>
<td>-.78*</td>
</tr>
<tr>
<td>Income Inequality</td>
<td>.53*</td>
</tr>
</tbody>
</table>

*P < .01

CDC’s Emphasis on HIV Testing in Health Care Settings: 2006 CDC Recommendations

• Routine, voluntary HIV screening for all persons 13-64 in health care settings, not based on risk
• Repeat HIV screening of persons with known risk at least annually
• Opt-out HIV screening with the opportunity to ask questions and the option to decline; include HIV consent with general consent for care

Bullet points quoted from Dr. Kevin Fenton, 2006 talk to CDC/HRSA CHAC
CDC’s Emphasis on HIV Testing in Health Care Settings: 2006 Recommendations – Slide 2

- Prevention counseling in conjunction with HIV testing in health care settings not required
  - Patients who test HIV positive are to be linked to clinical care, counseling, support and prevention services
  - HIV negative patients known to be at high risk should be advised of need for periodic re-testing and offered or referred for prevention counseling
    - Holtgrave Note: CDC recommends no risk assessment
- Recommendations intended for all health care settings
- Recommendations not intended for non-clinical settings, such as CBOs

Bullet points quoted from Dr. Kevin Fenton, 2006 talk to CDC/HRSA CHAC
CDC’s Emphasis on HIV Testing in Health Care Settings: 2006 Recommendations – Slide 3

- Recommendations on referral to care remain unchanged (i.e., all HIV-positive persons should be referred or linked to care)

- Low prevalence settings:
  - Initiate screening
  - If prevalence shown to be < 1 per 1000, continued screening no longer warranted

Bullet points quoted from Dr. Kevin Fenton, 2006 talk to CDC/HRSA CHAC
What will CDC’s Opt-Out Testing Guidelines Cost, and What are the National Consequences?

• CDC stated at a Kaiser Family Foundation Forum in October, 2006 that it doesn’t know the answers to these questions

• Congressperson Waxman has asked these questions of CDC in May 2, 2007 letter to CDC Director, Dr. Gerberding
Potential Impact of HIV Seropositivity Awareness via Counseling and Testing on HIV Incidence

<table>
<thead>
<tr>
<th>HIV Seropositivity Awareness</th>
<th>No. New HIV Infections (1 Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75%</td>
<td>45,000</td>
</tr>
<tr>
<td>80%</td>
<td>40,000</td>
</tr>
<tr>
<td>85%</td>
<td>35,000</td>
</tr>
<tr>
<td>90%</td>
<td>30,000</td>
</tr>
<tr>
<td>95%</td>
<td>25,000</td>
</tr>
<tr>
<td>100%</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Holtgrave, Pinkerton. JAIDS. 2007.
Estimated Annual HIV Incidence Over 10-Year Time Horizon at 75%, 85%, and 95% Serostatus Awareness Levels

## Costs and Consequences of Four HIV Testing Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>No. tested</th>
<th>No. undiagnosed HIV+ reached</th>
<th>No. high risk HIV-reached</th>
<th>Total program costs</th>
<th>Transmissions averted</th>
<th>Infections averted</th>
<th>Total avoided infections</th>
<th>Gross cost per avoided infection</th>
<th>Public support for HIV care 1 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opt-out Testing Only</strong></td>
<td>65,520,000</td>
<td>56,940</td>
<td>Not relevant</td>
<td>$864,207,288</td>
<td>3,644</td>
<td>Not relevant</td>
<td>3,644</td>
<td>$237,149</td>
<td>$961,335,502</td>
</tr>
<tr>
<td><strong>Opt-out Testing with Behavioral Offset</strong></td>
<td>65,520,000</td>
<td>56,940</td>
<td>7,649,048</td>
<td>$864,207,288</td>
<td>3,644</td>
<td>(569)</td>
<td>3,076</td>
<td>$280,993</td>
<td>$961,335,502</td>
</tr>
<tr>
<td><strong>Routine Counseling and Testing</strong></td>
<td>65,520,000</td>
<td>56,940</td>
<td>7,649,048</td>
<td>$1,419,250,220</td>
<td>3,644</td>
<td>1,689</td>
<td>5,333</td>
<td>$266,128</td>
<td>$961,335,502</td>
</tr>
<tr>
<td><strong>Targeted C &amp; T (à la Pres. FY07 $93m language)</strong></td>
<td>29,868,308</td>
<td>188,170</td>
<td>14,636,964</td>
<td>$864,207,288</td>
<td>12,043</td>
<td>2,510</td>
<td>14,553</td>
<td>$59,383</td>
<td>$3,176,937,598</td>
</tr>
</tbody>
</table>

## Costs and Consequences of Targeted C&T at Various Seropositivity Levels

<table>
<thead>
<tr>
<th></th>
<th>Targeted C &amp; T at 1% Seropositivity</th>
<th>Targeted C&amp;T at 0.3% Seropositivity</th>
<th>Targeted C&amp;T at 0.3% Seropositivity and No Benefit Counseling HIV-</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. tested</td>
<td>29,868,308</td>
<td>30,425,861</td>
<td>30,425,861</td>
</tr>
<tr>
<td>No. undiagnosed HIV+ reached</td>
<td>188,170</td>
<td>57,505</td>
<td>57,505</td>
</tr>
<tr>
<td>No. high risk HIV- reached</td>
<td>14,636,964</td>
<td>15,015,619</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total C&amp;T service costs</strong></td>
<td>$864,207,288</td>
<td>$864,207,288</td>
<td>$864,207,288</td>
</tr>
<tr>
<td>Transmissions averted</td>
<td>12,043</td>
<td>3,680</td>
<td>3,680</td>
</tr>
<tr>
<td>Infections averted</td>
<td>2,510</td>
<td>3,345</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total avoided infections</strong></td>
<td>14,553</td>
<td>7,026</td>
<td>3,680</td>
</tr>
<tr>
<td>Gross cost per avoided infection</td>
<td>$59,383</td>
<td>$123,007</td>
<td>$234,819</td>
</tr>
<tr>
<td>Public support for HIV care 1 yr</td>
<td>$3,176,937,598</td>
<td>$970,872,510</td>
<td>$970,872,510</td>
</tr>
</tbody>
</table>

Impact of “C” in VCT for Persons Testing HIV Seronegative

- CDC’s Project RESPECT*
- 4 arms in RCT (all arms included HIV testing)
  - 4 session counseling
  - 2 session (pre- and post-test) counseling
  - Didactic information
  - Didactic information and no follow up until final time point (to control for impact of repeated surveys)
- STD clinics in Baltimore, Denver, Long Beach, Newark, San Francisco (5,758 HIV- clients)

Project RESPECT* (continued)

- No major difference between 2 and 4 session counseling
- Pre- and post-test counseling better than simple provision of didactic information
  - Increased highly consistent condom use through 6 month follow-up
  - Decreased incident STDs by 30% at 6 month follow-up
  - Decreased incident STDs by 20% at 12 month follow-up
  - Findings consistent across sites

“This study showed that it’s not how much you talk to people about HIV prevention that matters most – but how you talk to them…..,” Dr. Helene Gayle

“According to CDC, the brief sessions used in this study…are feasible to implement in busy health care settings.”

“In this study, the approach was implemented with existing clinic staff, in not much more time than that required for didactic messages, and cost only $8 additional dollars per client to implement.”

“Far too often, prevention programs found to be ideal in research are too difficult and expensive to implement in the real world,” said Dr. Mary Kamb. “With this program the ideal can be real, with few additional resources.”
Potential Impact on HIV Incidence of Three Program Types

*Opt-Out Testing

Targeted CT (instead of opt-out testing)

Disease Elimination Program*

*Disease elimination program essentially unrelated to knowledge of serostatus
Conclusions

- HIV prevention programs have brought down HIV incidence but are held hostage to flat funding; that fact must be addressed
Conclusions (continued)

- Targeted HIV counseling and testing may have substantially more public health benefits than opt-out testing at the same cost
  - Diagnoses
  - Prevention
  - Cost per infection/transmission prevented
Conclusions (continued)

- Promotion of serostatus awareness via counseling and testing might get nation to an annual incidence level in the 25,000 to 30,000 range (down from 40,000), but reducing incidence further than that will have little to do with serostatus awareness.
Conclusions (continued)

• A multi-component, multi-level, evidence-based comprehensive national HIV prevention plan for the US is necessary and urgently needed (as UNGASS has suggested)
  – This plan should identify necessary public health goals, not goals simply based on status quo funding

• A plan is needed (as are substantial new resources) for providing high quality HIV care and treatment to persons newly identified as HIV-positive by serostatus awareness efforts