Disparities in HIV Treatment Engagement, Adherence, and Outcomes

Gregorio Millett
International Conference on HIV Treatment and Prevention Adherence
June 4, 2013
Outline

• HIV/AIDS disparities in U.S.
• Demographic disparities across treatment cascade
• Structural disparities and the treatment cascade
• Similar disparities in resource rich nations
• Successes in overcoming disparities
• Summary
Likelihood of HIV Infection by Demographics

New infections among youth (13-24), 2010

- 26% of new infections nationally
- 60% African Americans
- 4 in 5 new infections among males (70% MSM)
- Young MSM only US population where new infections increasing
  - 48% increase young black MSM (2006-2009)
  - Young black MSM 55% of new infections among MSM in 2010

Hall et al. JAIDS. 2008; 49: 294-297; MMWR, 2011
Disparities by Demographic Group Across Treatment Cascade

- **Diagnosed:** 82%
- **Linked to Care:** 66%
- **Retained in Care:** 37%
- **Prescribed ART:** 33%
- **Virally Suppressed:** 25%

AIDS Mortality by Race

Å AIDS deaths have declined least in the ART era
   • Among PWAs living in the South (Prejean et al, 2012)
   • Among black and Latino MSM relative to white MSM (Blair et al., 2002; Hall et al., 2007)
   • Among black women compared to white men (44% vs. 79%, respectively; CDC 2009)
   • Among Latinos compared to blacks or whites (Cunningham et al., 2010)

Mortality incident rate-ratios between blacks and whites have increased since availability of ART
   ▲ Reason: Less access to healthcare in racial minority communities

Note. HAART = highly active antiretroviral therapy; IRR = incident rate ratio. For each period, the results from the model were adjusted for age, gender, and urbanicity. Whites were the reference group.

(Levine, 2007)
Youth and HIV-Related Disparities

Youth and HIV-Related Disparities


<table>
<thead>
<tr>
<th>Age at eligibility</th>
<th>ART Initiation (at 6 mo of Eligibility)</th>
<th>Viral Load Suppression (at 1 y of Eligibility)</th>
<th>Viral Load Suppression (1 y After ART Initiation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Adjusted HR (95% CI)</td>
<td>No.</td>
</tr>
<tr>
<td>18–29</td>
<td>1848</td>
<td>Ref.</td>
<td>1639</td>
</tr>
<tr>
<td>30–39</td>
<td>3434</td>
<td>1.10 (1.02, 1.19)</td>
<td>2987</td>
</tr>
<tr>
<td>40–49</td>
<td>3618</td>
<td>1.14 (1.06, 1.24)</td>
<td>3056</td>
</tr>
<tr>
<td>50–59</td>
<td>1460</td>
<td>1.23 (1.12, 1.36)</td>
<td>1236</td>
</tr>
<tr>
<td>≥60</td>
<td>332</td>
<td>1.13 (0.97, 1.33)</td>
<td>268</td>
</tr>
</tbody>
</table>

*ART eligibility: Incident AIDS-defining illness or a recorded CD4+ count of <350 cells/μL

(Hanna, CID, 2013)
Youth and HIV-Related Disparities

Retrospective CA/CO (Ryscavage, 2011)
46 youth (17-24) matched with 46 adult controls (25-40). Data collected 2003-2009, Northwestern Hospital

- HIV-1 viral suppression at 6 months OR, 0.330 (95% CI 0.125, 0.870)
- Viral rebound OR, 11.94 (95% CI 3.25, 43.85)
- LTFU OR, 6.22 (95% CI 2.07, 18.68)
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Black youth lowest probability of virologic suppression at 6 months (44%), compared to
- Black adults (71%)
- Nonblack youth (77%)
- Nonblack adults (91%)

Black youth had highest predicted probability of viral rebound (72%) compared to
- Nonblack youth (42%)
- Black adults (18%)
- Nonblack adults (6%)
HIV-Related Disparities by Sex

• Higher diagnosis rates and higher CD4 among women (Meditz, 2011)

• Time in care and on HAART least for females than males (57% vs. 71%; P=.01) (Meditz, 2011)

• Women significantly less likely to use HIV primary care services (OR 0.56, CI 0.35, 0.90)
  greater use of the emergency department (OR 2.13, 1.31, 3.46) (Sohler, 2009)

• Mortality higher among women
  Even after adjustment for the length of time on HAART (Lemly, 2009)

• Domestic violence (Machtinger, 2012)
  Meta-analysis: 29 US studies women PLWHIV
    • 30% PTSD (5x times national rate)
    • 55.3% intimate partner violence (>2x the national rate)
    • Recent trauma associated with 4x odds of ART failure
    • Domestic violence doubled risk of death
Foreign-Born Latinos & HIV Outcomes

Factors in the Delayed HIV Presentation of Immigrants in Northern California: Implications for Voluntary Counseling and Testing Programs

Table 1 Demographic characteristics, CD4+ count at entry into AIDS program and prevalence of opportunistic infections (OIs) at HIV diagnosis among immigrant and U.S.-born patients in the San Mateo County AIDS program, Northern California 2000–2002 (n = 391)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Immigrants (n = 94) N(%) or median (IQR)</th>
<th>U.S.-Borna (n = 297) N(%) or median (IQR)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maleb</td>
<td>71 (75.5%) or 219 (73.7%)</td>
<td>219 (73.7%) or median (IQR)</td>
<td>0.649</td>
</tr>
<tr>
<td>Median age</td>
<td>31 (27–38) or 35 (29–41)</td>
<td>35 (29–41) or median (IQR)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hispanic ethnicity</td>
<td>74 (78.7%) or 20 (6.7%)</td>
<td>20 (6.7%) or median (IQR)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Monolingual status</td>
<td>66 (70.2%) or 1 (0.34%)</td>
<td>1 (0.34%) or median (IQR)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Country of birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>57 (61.3%) or 219 (73.7%)</td>
<td>219 (73.7%) or median (IQR)</td>
<td></td>
</tr>
<tr>
<td>Central America</td>
<td>13 (14.0%) or 20 (6.7%)</td>
<td>20 (6.7%) or median (IQR)</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>12 (12.9%) or 1 (0.34%)</td>
<td>1 (0.34%) or median (IQR)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11 (11.8%) or 1 (0.34%)</td>
<td>1 (0.34%) or median (IQR)</td>
<td></td>
</tr>
<tr>
<td>Mean initial CD4+ count</td>
<td>287 cells/mm³ or 333 cells/mm³</td>
<td>333 cells/mm³ or median (IQR)</td>
<td>0.143</td>
</tr>
<tr>
<td>Prevalence of OIs</td>
<td>28 (29.8%) or 51 (17.2%)</td>
<td>51 (17.2%) or median (IQR)</td>
<td>0.009</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>19 (20.2%) or 37 (12.5%)</td>
<td>37 (12.5%) or median (IQR)</td>
<td>0.064</td>
</tr>
</tbody>
</table>

US-Mexico border: 46% Latinos dx late vs. 37% Whites (Espinoza, 2009)

Increased higher proportion of late diagnoses among foreign-born compared to US-born Latinos (51% vs. 39%)

Increased risk of delayed diagnosis among foreign-born vs. US-born males (AOR 1.7, 95% CI 1.4–2.2)

LA County Spanish-speaking Latinos 3x more likely to present late compared to English-speaking Latinos (Wohl, 2009)

Greater mortality rates among Latinos born in Puerto Rico than mainland US (Hanna, 2008; Nash, 2005)
Where are HIV-Related Disparities Greatest Between Black vs. Other MSM?

1. Black partners
2. Lower education
3. Low income
4. Crack cocaine
5. HIV status nondisclosure (HIV+ MSM)
6. Ever incarcerated
7. Childhood sex abuse
8. Early sex debut
9. Older partners
10. Unemployment
11. Concurrent partners
12. Receptive UAI
13. Serodiscordant UAI (HIV- MSM)
14. HIV+ partners (HIV- MSM)
15. Serodiscordant UAI (HIV+ MSM)
16. Injection drugs
17. Circumcision
18. 1 vs. >1 lifetime HIV tests
19. Number of sex partners
20. Race of partners
21. Serosorting (HIV- MSM)
22. Drug use before/during sex
23. Gay ID
24. Amphetamines
25. Amyl nitrates

(Millett, 2012)
Disparities persist between black and other MSM throughout treatment cascade (24 comparative studies)

Undiagnosed HIV
OR, 6.38 (4.33-9.39)

Diagnosed HIV+
OR, 3.00 (2.06-4.40)

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

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

HIV suppression
OR, 0.51 (0.31-0.83)

ART adherence
OR, 0.50 (0.33-0.76)

Healthcare visits
OR, 0.61 (0.42-0.90)

Health insurance
OR, 0.47 (0.29-0.77)

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

HIV Detection

“To eliminate difference in viral suppression, an estimated additional 38,920 black MSM and 17,043 Latino MSM would need to be on treatment to raise viral suppression to levels on par with white MSM aware of their infection (56%).” (Hall, 2013)

(Millett, 2012)
Figure 1. Percent of estimated diagnoses\textsuperscript{a} of AIDS by region\textsuperscript{b} and year, United States, 1981-2010

\textsuperscript{a}Diagnoses of AIDS were adjusted for reporting delay, but not for incomplete reporting

\textsuperscript{b}Regions consist of Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont), Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), South (Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), and West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming)

(Slide courtesy Joseph Prejean)
ART Initiation and Survival, Southern US vs. Other Regions

Compared to South, PWAs from other regions more likely to initiate treatment (Hazard Ratio [HR], 1.26, 95% CI, 1.0–1.57; P= 004) (Meditz, 2011)

Table 2. Proportional Hazards Models for Time to Antiretroviral Therapy Initiation by Race and Sex and by Race Within Region

<table>
<thead>
<tr>
<th>Race and sex</th>
<th>HR</th>
<th>(95% CI)</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>White men</td>
<td>1.0</td>
<td>Reference</td>
<td>...</td>
</tr>
<tr>
<td>White women</td>
<td>1.42</td>
<td>(1.01–1.99)</td>
<td>.040</td>
</tr>
<tr>
<td>Nonwhite women</td>
<td>.55</td>
<td>(.36–.83)</td>
<td>.004</td>
</tr>
<tr>
<td>Nonwhite men</td>
<td>.80</td>
<td>(.68–.93)</td>
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<table>
<thead>
<tr>
<th>Race within region</th>
<th>HR</th>
<th>(95% CI)</th>
<th>P</th>
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<tbody>
<tr>
<td>South</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonwhite</td>
<td>1.0</td>
<td>Reference</td>
<td>...</td>
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<tr>
<td>White</td>
<td>.80</td>
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NOTE. CI, confidence interval; HR, hazard ratio.
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Among blacks and Latinos, survival after HIV dx worse in the South than other regions (Prejean, 2012)

Within the South

- survival at 36 months after HIV dx best for whites vs blacks or Latinos
- males in urban areas at HIV dx had higher survival rates at 36 months vs males in suburban or rural areas

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Race within region

- South
  - Nonwhite | 1.0 | Reference | … |
  - White    | .80 | (1.51–1.25)| .23 |

NOTE. CI, confidence interval; HR, hazard ratio.
HIV Infection Among Heterosexuals in Urban Areas, by Socio-Economic Indicators, 2006-2007, N=14,837

Structural/Environmental

Disparities by Structural Factors Across Treatment Cascade

Structural Disparities and Earlier ART

New US treatment guidelines recommend antiretroviral treatment for all people with HIV

TREATMENT GUIDELINES

Keith Alcorn
Published: 29 March 2012

Newly updated US antiretroviral treatment guidelines are recommending antiretroviral treatment for all people with HIV infection, with particular emphasis on treatment for people with CD4 cell counts below 500; anyone at risk of transmitting HIV to partners; pregnant women; and people with hepatitis B co-infection or HIV-related kidney disease.

The new recommendations strengthen previous US recommendations on when to start treatment, which recommended initiating treatment at CD4 cell counts between 350 and 500 cells/mm³. The 2009 guidelines panel was, however, divided as to the strength of this recommendation: based on available evidence, 55% of the panel considered it a 'strong' recommendation and 45% 'moderate'.

The new Department of Health and Human Services (DHHS) guidelines state that "antiretroviral therapy is recommended for all HIV-infected individuals".

Evidence of SF policy Effectiveness

“In multivariate analyses (adjusting for age, sex, and injection drug use), the likelihood of HIV suppression more than doubled (at SFGH's Ward 86 Clinic) after adoption of the new policy.”

(Geng, CROI, 2012)
Structural Disparities and Earlier ART

- Initiating ART at higher CD4 leaves disenfranchised and most at-risk populations behind.

- People who started ART at higher CD4 (above 500 cells/mm³) were more likely to be white, MSM, utilized private doctors (vs. being poor).

- ‘Initiating ART at CD4 > 350 and possibly > 500 cells/mm³ exposes a new potential inequality for populations already disproportionately affected by HIV, including youth, African Americans, the poor, and those diagnosed at facilities other than private providers’
  (Truong, CROI, 2012)

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  (Geng, CROI, 2012)
AIDS Mortality by Race and Income, 1987-2011

(Singh, 2013)
Failure to Dx Populations at Highest Risk for HIV

- Kaiser Permanente: Medical record review past 5 years in care before HIV dx of 440 KP patients at 8 sites (Klein, 2003)

- 86% belonged to HIV risk group (MSM or IDU)
  - Risk factors recorded in only 26% of patients >1 year before HIV diagnosis.

- Nearly one half with newly diagnosed HIV had AIDS-defining CD4 or another AIDS-defining condition
  - 62% were clinically eligible for ART

- Access to medical care is not sufficient for early detection.
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- Access to medical care is not sufficient for early detection.

- 1208 MSM (597 black, 611 Latino) not previously diagnosed with HIV
  - 105 black, 33 Latino MSM HIV-positive unaware (Millett, 2011)

- Black MSM who were HIV-positive unaware
  - 3x more likely than HIV- black MSM to have health insurance
  - 3x more likely to have disclosed sexuality their healthcare provider
  - 94% less likely to have more than 3 lifetime HIV test

- Of 44 undiagnosed HIV+ black MSM who disclosed sexuality to provider
  - UIAI with 9 HIV- partners past 3 mos
  - URAI with 14 HIV- partners past 3 mos
Cultural congruence and HIV care

Early Linkage and Retention in Care: Findings from the Outreach, Linkage, and Retention in Care Initiative Among Young Men of Color Who Have Sex with Men


- 334 young black and Latino MSM
- Latino MSM more likely than Black MSM to be retained in care (96.2% vs. 79.9%; p = 0.006).
- Black MSM more likely to report feeling respected by clinic (OR: 1.73, 95% CI: 1.10 to 2.75, P < 0.02)
Cultural congruence and HIV care

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Trust in Physicians and Racial Disparities in HIV Care

Somnath Saha, M.D., M.P.H.,1,4 Elizabeth A. Jacobs, M.D., M.P.P.,2 Richard D. Moore, M.D., M.H.S.,3 and Mary Catherine Beach, M.D., M.P.H.1

Cohort study: 1,104 African-American and 201 white PWAs between 2005 and 2008
Â Compared to white patients, nonwhites had lower levels of trust, ART initiation, adherence, and viral suppression.
Â Adjusting for patient’s perceived cultural distance from provider did not significantly affect disparities (p-values for mediation >.10).
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Table 3 Key characteristics of “more routine”a versus “less routine”b testers for HIV in the past yearc

<table>
<thead>
<tr>
<th>More routine testers (n=173) were more likely to:</th>
<th>Less routine testers (n=157) were more likely to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be OB/GYNd (47%)</td>
<td>Not be OB/GYN (only 12% are OB/GYN)</td>
</tr>
<tr>
<td>Report testing patients as routine practice (74%)</td>
<td>Report testing only patients who have risk factors (39% test routinely)</td>
</tr>
<tr>
<td>Be &lt;40 years old (32%; mean age 46 yrs)</td>
<td>Be &gt;40 years old (81%; mean age 49 yrs)</td>
</tr>
<tr>
<td>Be women (60%)</td>
<td>Be men (55%)</td>
</tr>
<tr>
<td>Have been tested for HIV themselves in past year (37%)</td>
<td>Not have been tested for HIV themselves in past year (only 16% were tested)</td>
</tr>
<tr>
<td>Perceive a higher local prevalence of HIV at the county (16%) and state (16%) levels</td>
<td>Perceive a lower local prevalence of HIV at the county (10%) and state (11%) levels</td>
</tr>
<tr>
<td>Have relatively more patients who are:</td>
<td>Have relatively fewer patients who are:</td>
</tr>
<tr>
<td>Black (62%)</td>
<td>Black (52%)</td>
</tr>
<tr>
<td>Low SES (34%)</td>
<td>Low SES (27%)</td>
</tr>
<tr>
<td>On Medicaid (30%)</td>
<td>On Medicaid (18%)</td>
</tr>
<tr>
<td>HIV positive (9%)</td>
<td>HIV positive (4%)</td>
</tr>
</tbody>
</table>

(Jordan, 2013)
Disparities persist even when healthcare available, VA studies

race and Mental Health Diagnosis Are Risk Factors for Highly Active Antiretroviral Therapy Failure in a Military Cohort Despite Equal Access to Care

Joshua D. Hartzell, MD,*†† Katherine Spooner, MD,*‡§ Robin Howard, MA,‖ Scott Wegner, MD,§ and Glenn Wortmann, MD*††

Rural Residence and Adoption of a Novel HIV Therapy in a National, Equal-Access Healthcare System

Michael Ohl, Brian Lund, Pamela S. Beierho, Matthew Bidwell Goetz, David Rimland, Kelly Richardson, Amy Justice, Eli Perencevich, Mary Vaughan-Sarazin

Virologic Response Differences Between African Americans and European Americans Initiating Highly Active Antiretroviral Therapy With Equal Access to Care

Amy C. Weintrob, MD,* Greg A. Grandits, PhD,*† Brian K. Ayan, MD,* Anuradha Ganesan, MD,*§ Michael L. Landrum, MD,*§ Nancy F. Crum-Cianflone, MD, MPH,*†† Erica N. Johnson, MD,*§ Claudia E. Ordóñez, MA,** Glenn W. Wortmann, MD,*† and Vincent C. Marconi, MD*§ and the IDCRP HIV Working Group

Retention in Care: A Challenge to Survival with HIV Infection

Thomas P. Giordano,1,4 Allen L. Gifford,2,3§ A. Clinton White, Jr,1,4 Maria E. Suarez-Almazor,1,4 Lisa A. Backus,6 Larry A. Mole,5 and Robert O. Morgan1,2

“Even in a system with few financial barriers to care, a substantial portion of HIV-infected patients have poor retention in care.”

“Urban residence predicted raltegravir adoption within 180 days (OR 1.72, 95% CI 1.09–2.70) and 360 days (OR 1.63, 95% CI 1.13–2.34). Efforts are needed to reduce geographic variation in adoption of advances in HIV therapy.”

“Despite similar durations of HIV infection and equal access to healthcare, AAs were significantly less likely to achieve viral suppression compared with European Americans”

“Equal access to care yields high efficacy rates with HAART but does not fully equilibrate racial differences in virologic failure.”
HIV infection disparities and access to ART
black MSM, U.S. and U.K.

<table>
<thead>
<tr>
<th></th>
<th>Canadian studies</th>
<th>UK studies</th>
<th>US studies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>k</td>
<td>Summary OR (95% CI)*</td>
<td>k</td>
</tr>
<tr>
<td>HIV-positive status</td>
<td>4</td>
<td>1.46 (0.62-3.41)</td>
<td>9</td>
</tr>
<tr>
<td>Sexual risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UAI with male partners</td>
<td>8</td>
<td>0.85 (0.69-1.05)</td>
<td>11</td>
</tr>
<tr>
<td>UAI main male partner</td>
<td>2†</td>
<td>0.67 (0.40-1.22)</td>
<td>6</td>
</tr>
<tr>
<td>UAI casual male partner</td>
<td>4</td>
<td>0.98 (0.72-1.36)</td>
<td>6</td>
</tr>
<tr>
<td>UAI receptive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of male sex partners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any substance use</td>
<td>6</td>
<td>0.53 (0.38-0.75)†</td>
<td>2†</td>
</tr>
<tr>
<td>Injection drug use</td>
<td>3</td>
<td>0.40 (0.22-0.72)†</td>
<td></td>
</tr>
<tr>
<td>Substance use before or during sex</td>
<td>2†</td>
<td>0.78 (0.28-2.15)</td>
<td></td>
</tr>
<tr>
<td>STI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any STI</td>
<td>2†</td>
<td>1.12 (0.32-3.98)</td>
<td>4</td>
</tr>
<tr>
<td>Any viral STI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV prevention (HIV-negative MSM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV testing</td>
<td>5</td>
<td>0.88 (0.40-1.94)</td>
<td>7</td>
</tr>
<tr>
<td>Knowledge of PEP or Prep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV care (MSM diagnosed HIV positive)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>cART use</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Structural barriers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>3</td>
<td>1.56 (1.89-2.06)†</td>
<td></td>
</tr>
<tr>
<td>Any protective behaviours</td>
<td>19</td>
<td>1.02 (0.75-1.38)</td>
<td>22</td>
</tr>
</tbody>
</table>

(Millett, 2012)
Disparities in time between VL tests by region or demographics, Canada

Table 4 Multivariate GEE regression models of testing intervals and of probability of >9 and >6 months between viral load measurements

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Interval (days) between successive tests</th>
<th>Probability of an interval &gt;9 months</th>
<th>Probability of an interval &gt;6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate (95% CI)</td>
<td>p value</td>
<td>Odds Ratio (95% CI)</td>
</tr>
<tr>
<td>Intercept</td>
<td>125.8 (118.8, 132.9)</td>
<td>&lt;.0001</td>
<td>0.09 (0.07, 0.11)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Quebec</td>
<td>20.3 (15.5, 250)</td>
<td>&lt;.0001</td>
<td>1.72 (1.39, 2.14)</td>
</tr>
<tr>
<td>Ontario</td>
<td>18.7 (14.3, 230)</td>
<td>&lt;.0001</td>
<td>1.78 (1.37, 2.31)</td>
</tr>
<tr>
<td>BC</td>
<td>0</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>Age (per 10 years)</td>
<td>-3.8 (-5.4, -2.2)</td>
<td>&lt;.0001</td>
<td>0.77 (0.70, 0.85)</td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
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<tr>
<td>MSM</td>
<td>-9.2 (-13.1, -5.4)</td>
<td>&lt;.0001</td>
<td>0.62 (0.49, 0.78)</td>
</tr>
<tr>
<td>IDU</td>
<td>16.0 (11.1, 20.9)</td>
<td>&lt;.0001</td>
<td>1.68 (1.38, 2.05)</td>
</tr>
</tbody>
</table>

(Raboud, 2009)
Overcoming disparities

FIGURE. Number of publicly funded HIV tests among adults and adolescents, by race/ethnicity --- District of Columbia, 2004--2008

Number (in thousands)

- White
- Black/African American
- Hispanic/Latino
- Total

2004 2005 2006 2007 2008

**FIGURE.** Number of publicly funded HIV tests among adults and adolescents, by race/ethnicity --- District of Columbia, 2004--2008

![Graph showing HIV testing trends]

**TABLE 1. Number and rate of adults and adolescents newly diagnosed with AIDS, by race/ethnicity and sex --- District of Columbia, 2004--2008**

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/African American</td>
<td>2,836</td>
<td>86.0</td>
<td>657</td>
<td>240</td>
<td>563</td>
<td>207</td>
<td>604</td>
<td>223</td>
<td>573</td>
<td>213</td>
<td>439</td>
<td>164</td>
<td>-7.1</td>
<td>0.002</td>
</tr>
<tr>
<td>Males</td>
<td>1,857</td>
<td>56.0</td>
<td>448</td>
<td>373</td>
<td>364</td>
<td>305</td>
<td>389</td>
<td>328</td>
<td>371</td>
<td>315</td>
<td>285</td>
<td>244</td>
<td>-7.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Females</td>
<td>979</td>
<td>30.0</td>
<td>209</td>
<td>136</td>
<td>199</td>
<td>130</td>
<td>215</td>
<td>142</td>
<td>202</td>
<td>134</td>
<td>154</td>
<td>102</td>
<td>-5.3</td>
<td>0.050</td>
</tr>
<tr>
<td>Hispanic/ Latino†</td>
<td>175</td>
<td>5.0</td>
<td>48</td>
<td>122</td>
<td>43</td>
<td>109</td>
<td>28</td>
<td>71</td>
<td>35</td>
<td>88</td>
<td>21</td>
<td>51</td>
<td>-17.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Males</td>
<td>129</td>
<td>4.0</td>
<td>37</td>
<td>178</td>
<td>27</td>
<td>130</td>
<td>22</td>
<td>106</td>
<td>27</td>
<td>129</td>
<td>16</td>
<td>74</td>
<td>-15.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Females</td>
<td>46</td>
<td>1.0</td>
<td>11</td>
<td>59</td>
<td>16</td>
<td>86</td>
<td>6</td>
<td>32</td>
<td>8</td>
<td>42</td>
<td>5</td>
<td>25</td>
<td>-21.6</td>
<td>0.004</td>
</tr>
</tbody>
</table>
Improvement in the Health of HIV-Infected Persons in Care: Reducing Disparities

Richard D. Moore, Jeanne C. Keruly, and John G. Bartlett
Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland

![Graph showing ART utilization and Viral suppression over time for Black and White populations.](image-url)
Increasing HIV+ Awareness among MSM, NHBS 2008 & 2011

HIV+ MSM 2008 n=1520
HIV+ MSM 2011 n=1556

(Wejnert, 2013)

H. Fisher Raymond, DrPH, MPH, Yea-Hung Chen, MS, Theresa Ick, BA, Susan Scheer, PhD, MPH, Kyle Bernstein, PhD, SCM, Sally Liska, DrPH, MS, Brian Louie, BA, Mark Pandori, PhD, and Willi McFarland, MD, PhD, MPH, TM

<table>
<thead>
<tr>
<th>Variable</th>
<th>MSM1 2004</th>
<th>MSM2 2008</th>
<th>MSM3 2011</th>
<th>$\chi^2$ Test for Trend $P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV positive (by serological test in this study)</td>
<td>24.0 19.6, 28.1</td>
<td>23.0 19.0, 26.3</td>
<td>23.0 18.9, 26.6</td>
<td>0.73</td>
</tr>
<tr>
<td>Unrecognized HIV infection*</td>
<td>21.7 13.2, 30.3</td>
<td>18.0 10.9, 25.2</td>
<td>7.5 2.4, 12.7</td>
<td>0.025</td>
</tr>
<tr>
<td>Tested for HIV in the last 6 mos (if not known HIV+)</td>
<td>44.1 35.6, 49.6</td>
<td>55.2 50.4, 59.9</td>
<td>57.8 52.9, 62.6</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>HIV incidence (by BED assay, percent per year)</td>
<td>2.6 0.8, 4.3</td>
<td>0.7 0.1, 1.5</td>
<td>1.0 0.02, 1.9</td>
<td>0.06</td>
</tr>
<tr>
<td>Ever on ART*</td>
<td>71.2 60.6, 81.9</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Currently on ART*</td>
<td>—</td>
<td>—</td>
<td>79.3 70.6, 87.3</td>
<td>88.2 82.1, 94.3</td>
</tr>
<tr>
<td>Gonorrhea history in the last year (by self-report)</td>
<td>6.5 4.0, 8.9</td>
<td>7.7 5.4, 9.9</td>
<td>9.2 6.7, 11.7</td>
<td>0.15</td>
</tr>
<tr>
<td>Multiple sexual partners in the last year</td>
<td>79.3 75.2, 83.3</td>
<td>77.5 73.9, 81.1</td>
<td>76.5 72.8, 80.2</td>
<td>0.31</td>
</tr>
<tr>
<td>Methamphetamine use in the last year</td>
<td>22.8 18.6, 27.0</td>
<td>13.2 10.3, 16.2</td>
<td>11.9 9.1, 14.8</td>
<td>$&lt;0.001$</td>
</tr>
</tbody>
</table>

*Percent of HIV positives by serological test.
Summary

• HIV clinical outcomes consistently worse among set of demographic groups
• Social/structural factors exacerbate HIV-related disparities
• Disparities remain even when care access is equivalent
  - Similar disparities evident in other resource rich nations
  - Opportunities to identify causes transnationally
• HIV-related disparities can be reduced
  - Successful programs for eliminating HIV-related disparities should be studied and replicated