Testing Linkage to Care Plus Treatment (TLC+): Los Angeles County

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HIV Prevention Planning Meeting
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County of Los Angeles Public Health

Defining TLC+

TLC+: A holistic approach to HIV prevention, medical care, and supportive services

- **T** – Testing
- **L** – Linkage
- **C** – Care
- **+** – Treatment

Source: The Report of a U.S. Think Tank on HIV Treatment as Prevention - February, 2010
http://www.projectinform.org/testandtreat/index.shtml

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Testing Linkage to Care Plus Treatment (TLC+)

- A community level public health intervention aimed at reducing new HIV infections
  - TLC+ = Identifying unaware
  - TLC+ = Optimal care and treatment
  - TLC+ = ***Prevention***
- Is this a new concept?
- Current studies/evidence based?

Elements of TLC+

- Assuring HIV+ individuals know their status
- Effective and timely linkage to care for newly identified HIV+ individuals
- Re-engage individuals who have been lost to the system of care
- Evaluation of eligibility for ART
- Effective efforts to support retention in care and ART adherence
- ***Reduce HIV Transmission***

Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis

Attia, S et. al.

- **Objective**: Review evidence on risk of HIV transmission through unprotected sex among serodiscordant couples on ART
- 11 cohorts – 5,021 heterosexual couples: 461 HIV-transmission events
- **Findings**: Overall transmission rate from ART-treated patients was 0.46 (95% CI 0.19–1.09) per 100 person-years (5 events)
- **Transmission rate from HIV+ partner with VL< 400 copies/ml:**
  - On ART = 0 (95% CI 0-1.27)/100 person-years (2 studies)
  - Not on ART = 0.16 (95% CI 0.02-1.13)/100 person-years (5 studies)
- **Limitations**: insufficient data to calculate rates according to STI presence and condom use. Studies reviewed were mainly among heterosexual

AIDS 2009, 23:1397–1404

ART reduces Perinatal Transmission

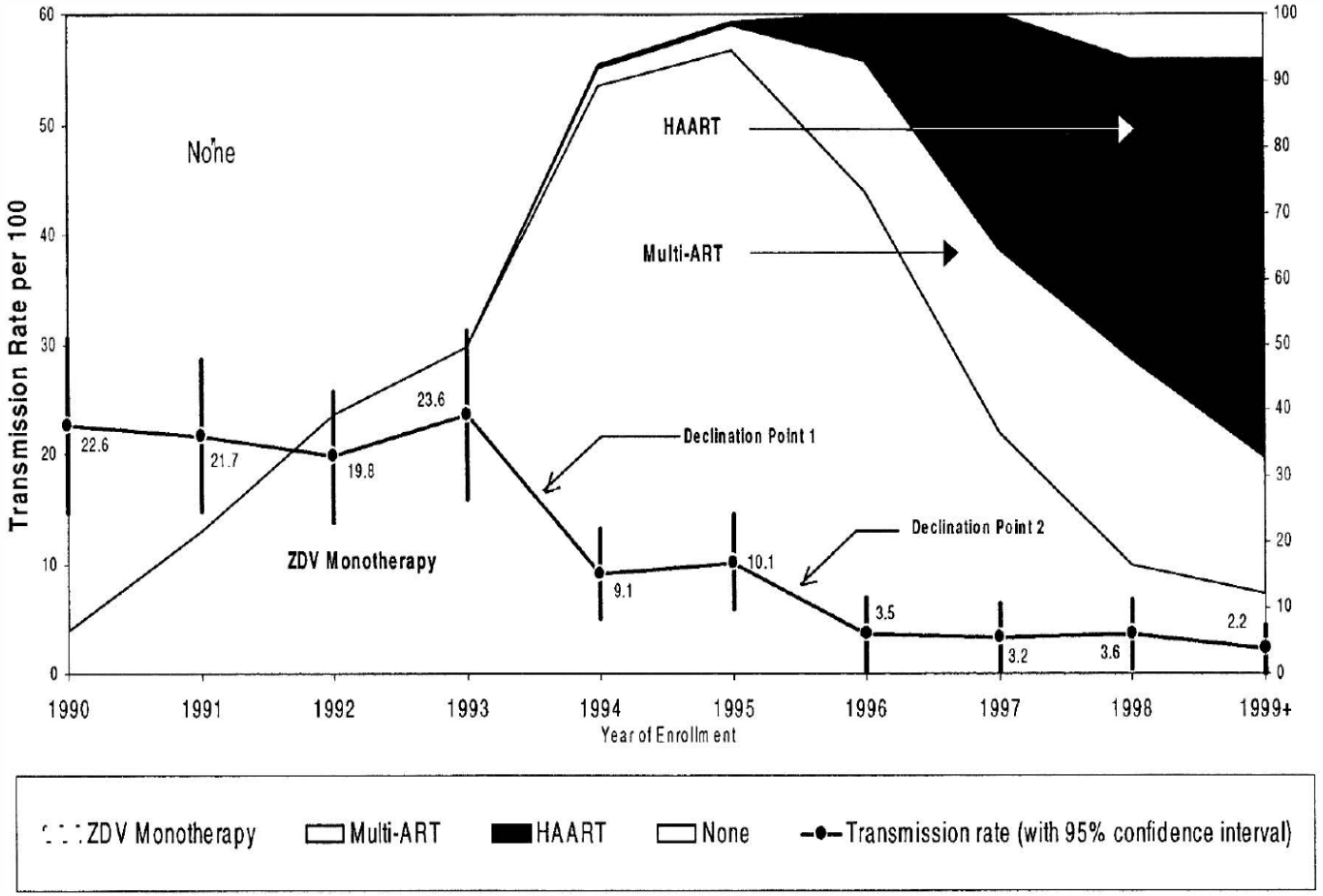

FIG. 1. Trends in mother-to-infant transmission rate and maternal antiretroviral therapy: 1990–1999+ (Women and Infants Transmission Study Group). Rates per 100 (95% confidence interval).

Cooper JAIDS 2002

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Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model

Granich, RM et. al.

- Objective:
  - Theoretical evaluation on effect on HIV transmission by treating new HIV diagnoses immediately
- Model assumptions:
  - South Africa has a generalized epidemic (18% prevalence)
  - All HIV transmissions are heterosexual
  - Most PLWHA would be on ART within 5 years
- Findings
  - HIV would transition from endemic to elimination phase
  - By 2016 or 10 years, HIV incidence and mortality would be <1/1,000 people
  - HIV prevalence will drop to <1% within 50 years

Lancet 2009; 373: 48–57

Simply Testing and Treating will not eliminate the epidemic…..

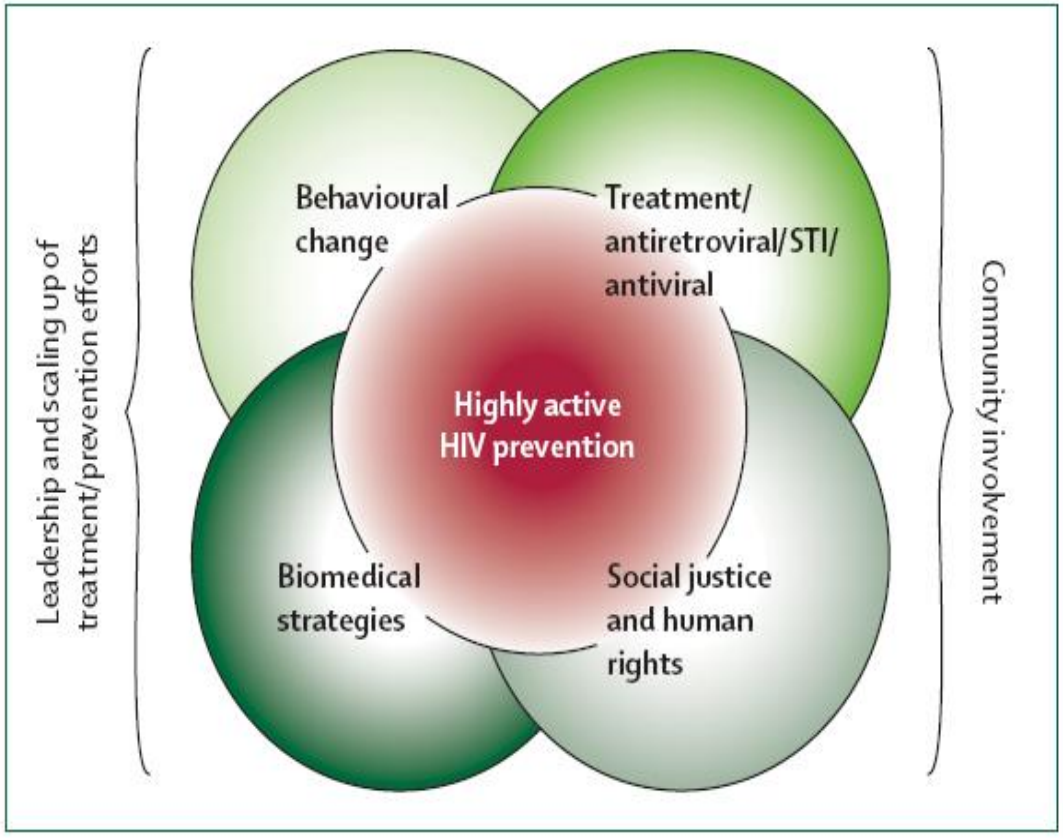

Figure 1: **Highly active HIV prevention**
This term was coined by Prof K Holmes, University of Washington School of Medicine, Seattle, WA, USA.[5] STI=sexually transmitted infections.

Coates, *Lancet*, 2008

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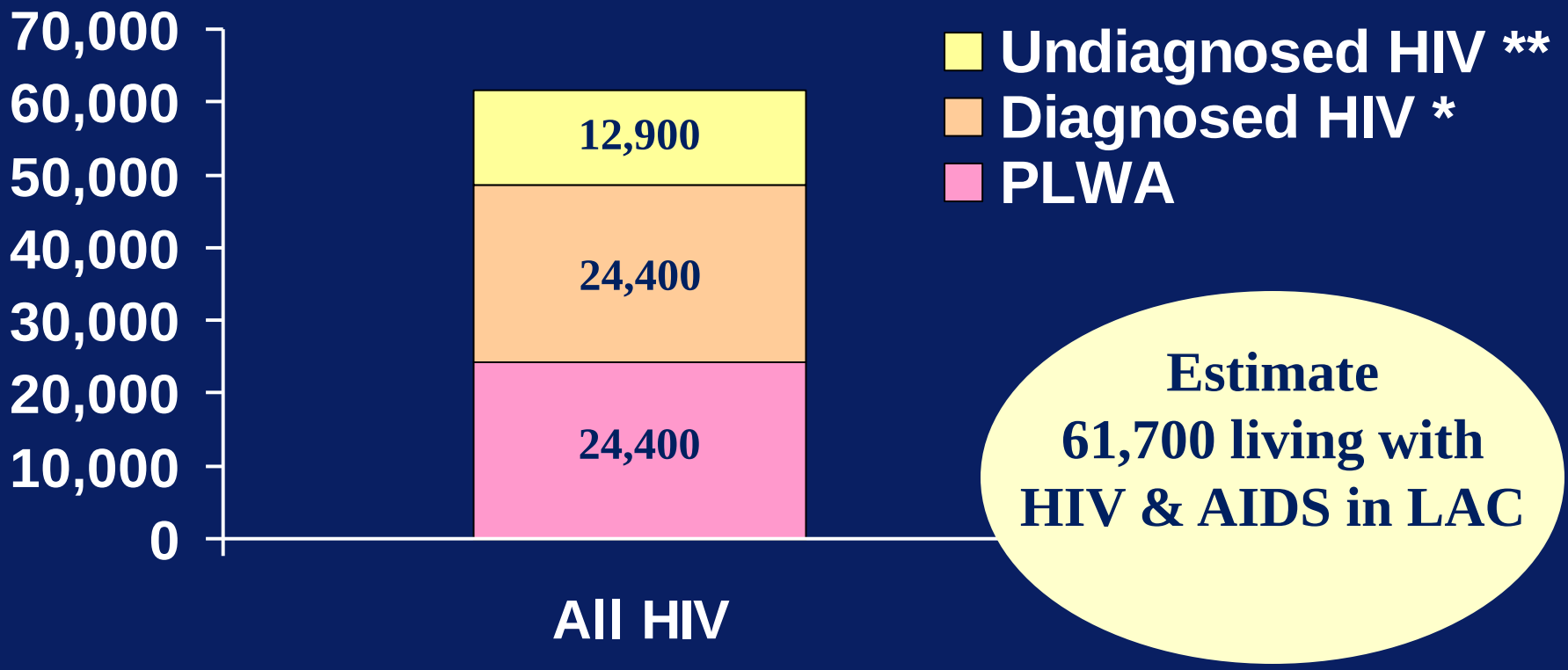
TESTING

Estimated Number of Persons Living with HIV or AIDS in LAC as of July 2009



*Estimate based on a 1:1 ratio of HIV (non-AIDS) to AIDS cases

**Estimate based on CDC's 2008 estimate that 21% are unaware of their HIV infection (CDC, 2008)

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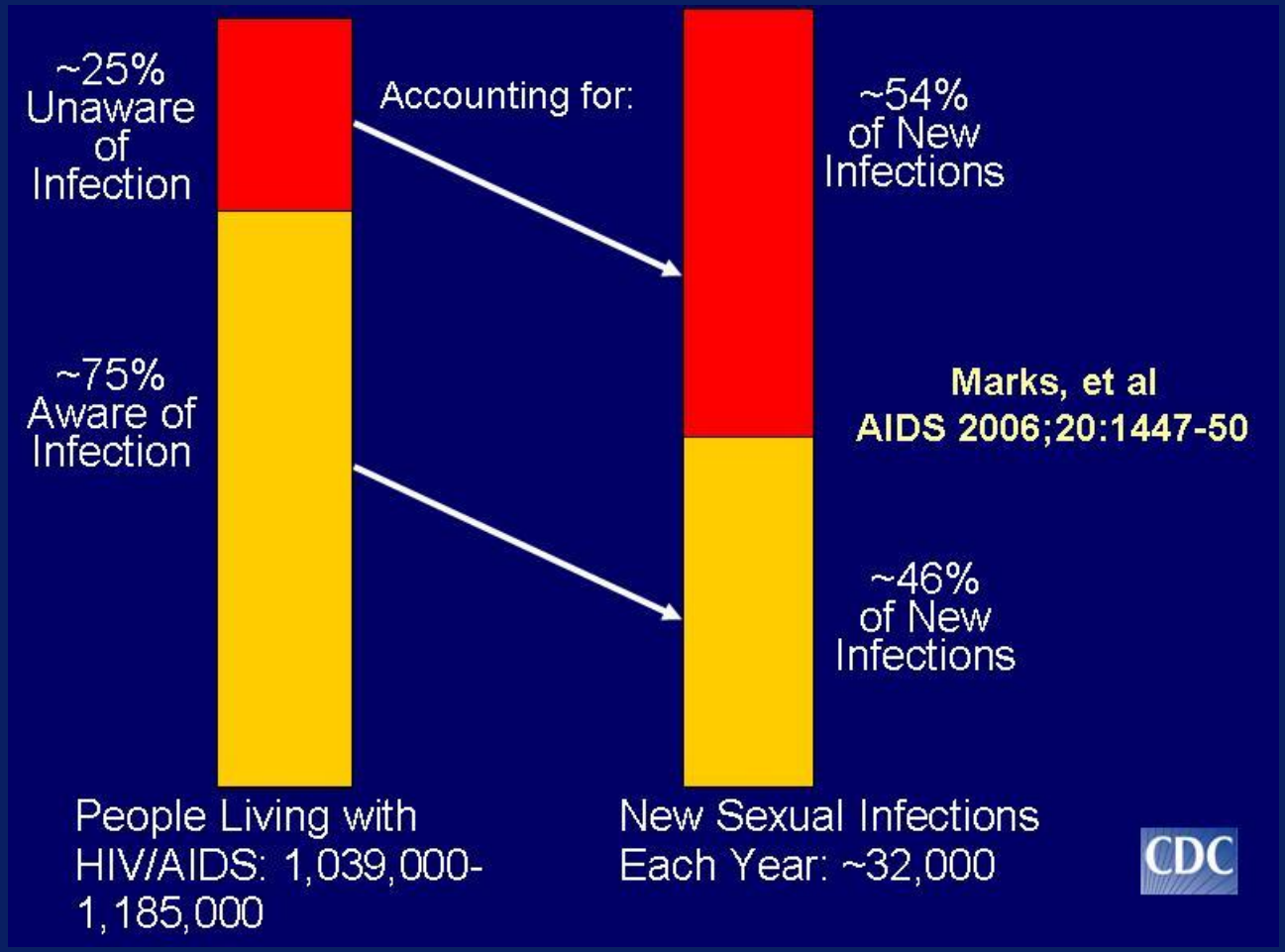
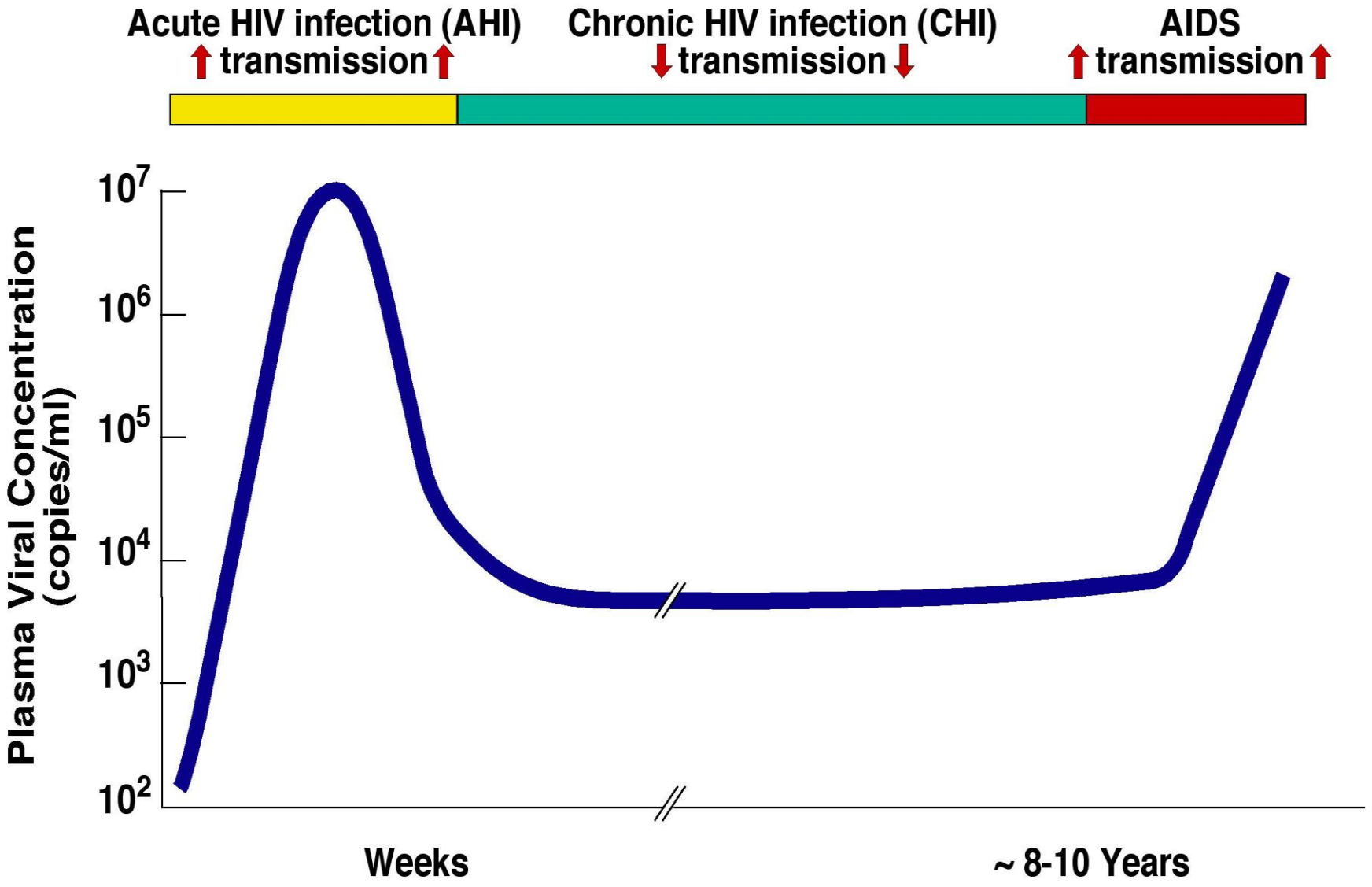
Awareness of Serostatus Among People with HIV and Estimates of Transmission



Typical Course of HIV Infection



Effect of Counseling in Conjunction with HIV testing

- Meta-analysis of 27 studies of HIV-CT:
  - HIV-positive participants reduced unprotected intercourse and increased condom use.
  - HIV-negative participants did not modify their behavior more than untested participants.

- Weinhardt et al, 1999: Am J Public Health

Cost Effectiveness

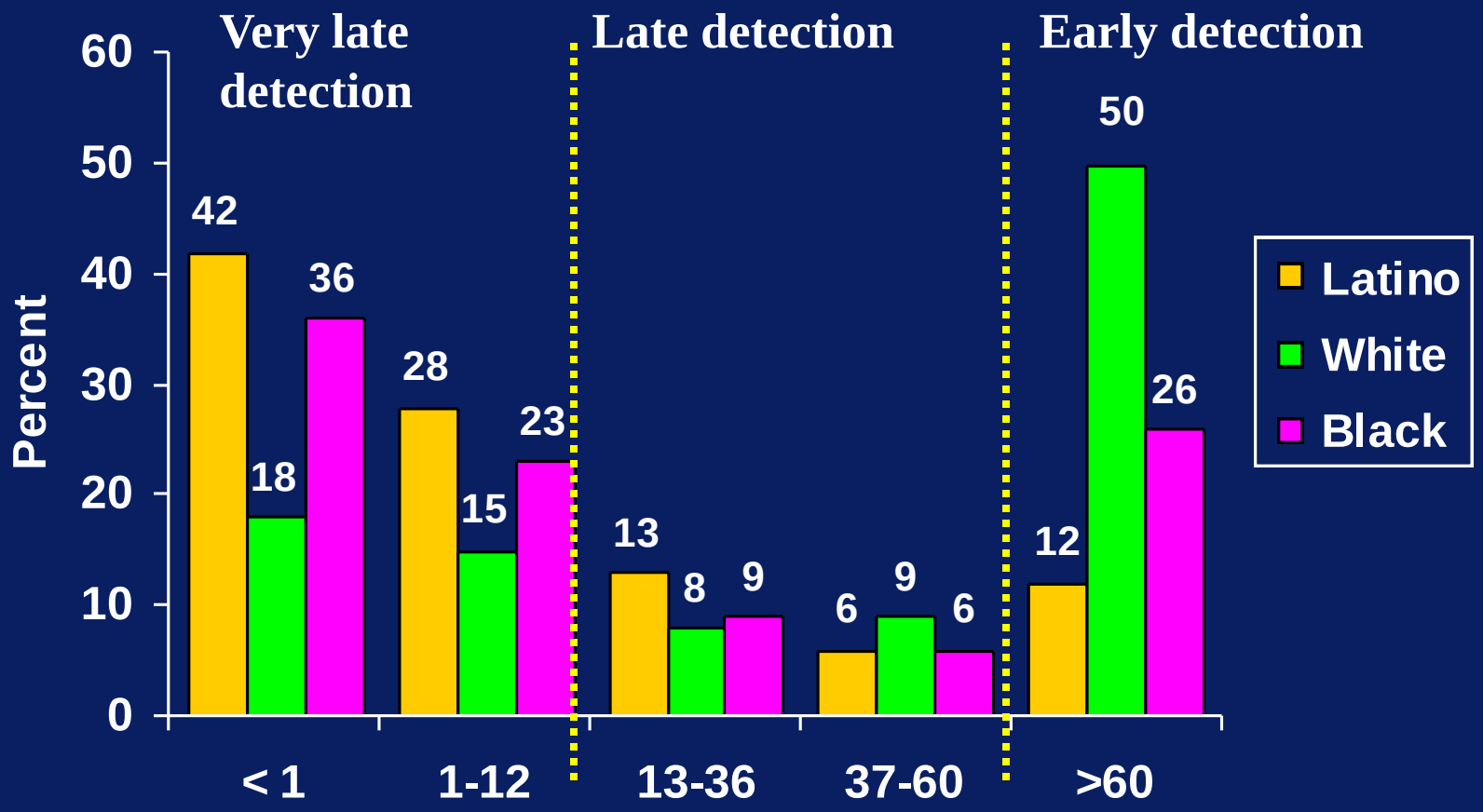
- Cost-effectiveness of screening for HIV in the era of HAART. *Sanders G, et al. NEJM 2005;352:570.*

  "The cost-effectiveness of routine HIV screening in health care settings, even in relatively low-prevalence populations, is similar to that of commonly accepted interventions, and such programs should be expanded."

  1% HIV prevalence: $15,078 per QALY

  >0.05% prevalence: <$50,000 per QALY

Time Between First Learned of HIV+ Status and AIDS Diagnosis



SHAS, HIV Epidemiology Program. LAC, 2000 - 2004 (N = 672)

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HIV Positivity & New Positivity Rates by OAPP-funded Testing Programs, 2009

Type of Testing Program	Number of HIV Tests	HIV Positivity Rate		HIV New Positivity Rate	
	N	n	(%)	n	(%)
Grand Total	**74,254**	**784**	**1.06%**	**644**	**0.87%**
Public Health STD Clinics	**25,171**	**203**	**0.81%**	**164**	**0.65%**
Routine Testing	**7,643**	**86**	**1.13%**	**81**	**1.06%**
Testing within Jail Settings	**9,631**	**6**	**0.06%**	**3**	**0.03%**
Targeted Testing Total	**31,809**	**489**	**1.54%**	**396**	**1.24%**
OAPP Subcontracted Agencies					
Storefront	*18,471*	*280*	*1.52%*	*227*	*1.23%*
Mobile Testing Unit Program	*6,419*	*73*	*1.14%*	*64*	*1.00%*
Multiple Morbidity Mobile Testing Units	*2,709*	*35*	*1.29%*	*22*	*0.81%*

***Numbers based on available HIV Testing data, January 1 - December 31, 2009, reported to OAPP. Numbers are based on tests, not necessarily individuals.**

HIV Positivity & New Positivity Rates by OAPP-funded Programs, 2009, cont.

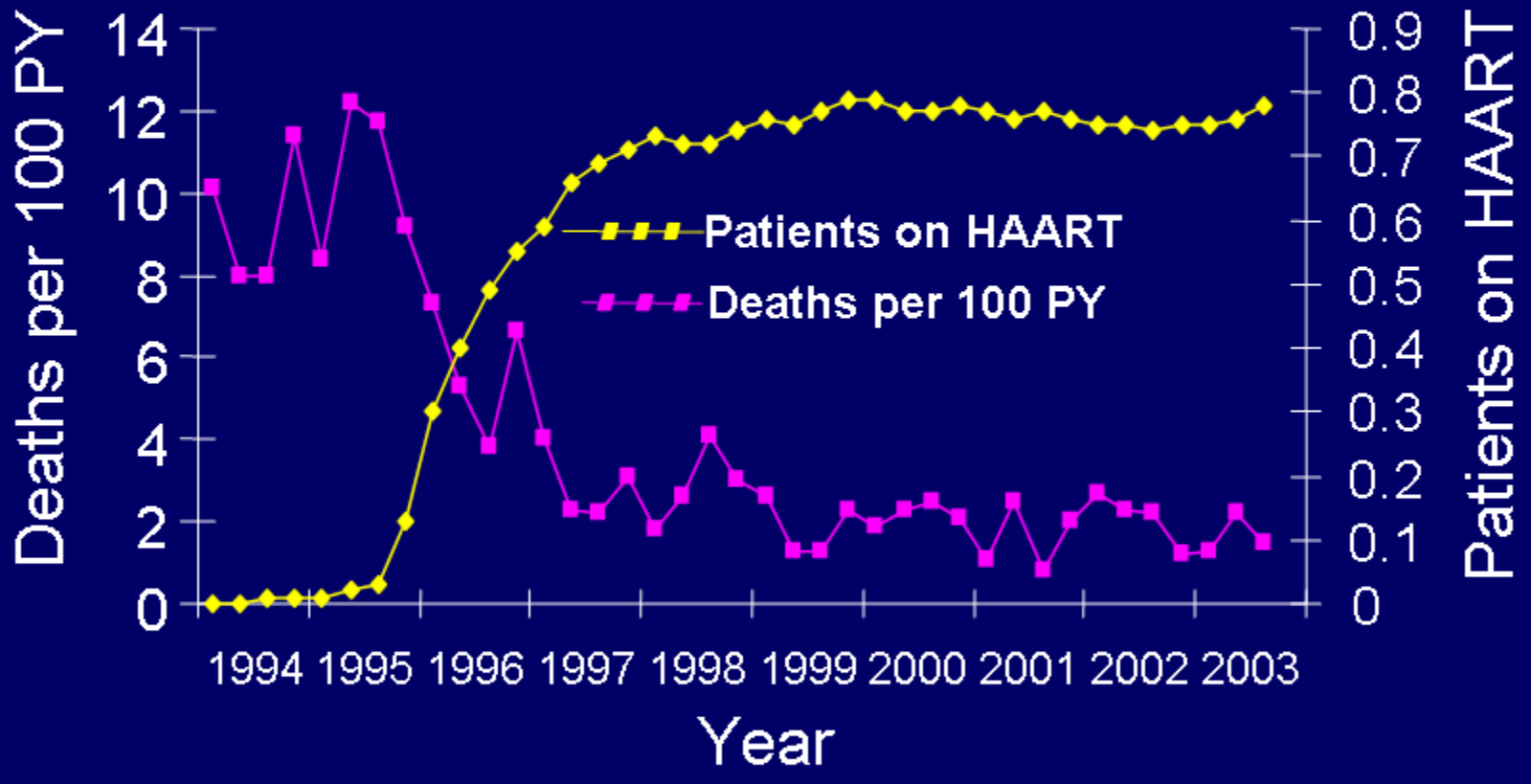
Type of Testing Program	Number of HIV Tests	HIV Positivity Rate		HIV New Positivity Rate	
	N	n	(%)	n	(%)
Targeted Testing Total (cont.)	**31,809**	**489**	**1.54%**	**396**	**1.24%**
Bath Houses and Sex Clubs	1,766	28	1.59%	27	1.53%
Court Ordered & Drug Expansion Testing Programs	1,797	34	1.89%	22	1.22%
HIV Clinic Testing	647	39	6.03%	34	5.26%

OAPP funded testing = 40% of all testing in LAC / year

***Numbers based on available HIV Testing data, January 1 - December 31, 2009, reported to OAPP. Numbers are based on tests, not necessarily individuals.**

LINKAGE

Mortality and HAART Use Over Time
HIV Outpatient Study, CDC, 1994-2003



Brief Strengths-Based Case Management Promotes Entry Into HIV Medical Care

Results of the Antiretroviral Treatment Access Study-II

Craw, JA et. al.

ARTAS Linkage Case Management Intervention

- 626 recently HIV diagnosed individuals recruited from 10 US study sites
- 79% entered care within the first 6 months
- Through the intervention, the following were significantly more likely to have received care:
  - >25 yrs of age
  - Hispanic
  - Stably housed
  - Had not recently used non-injection drugs
  - Attended 2+sessions with the case manager
  - Recruited at a study site that had HIV medical care co-located on its premises

J Acquir Immune Defic Syndr, 2008

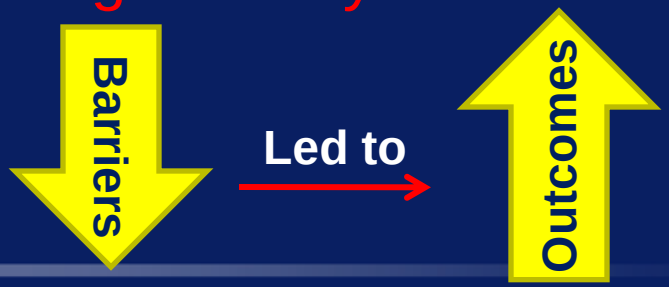
AIDS PATIENT CARE and STDs
Volume 21, Supplement 1, 2007

DOI: 10.1089/apc.2007.9987

HIV System Navigation: An Emerging Model to Improve HIV Care Access

Bradford, JB et. al.

- Goal: evaluate the use of a patient navigation model to reduce structural barriers to HIV care
- Study population: HIV+ clients not fully engaged in care (N = 437)
- Evaluated structural, financial, and personal barriers
- Findings: Structural barriers to care and provider engagement were significantly associated with improved health outcomes



Linkage to Care (LTC)

- LTC for all of LAC based on surveillance data
  - 66% of individuals newly dx with HIV in 2007-2008 linked to care within 1 yr (total of 4671 new cases)
- LTC for OAPP funded testing sites
  - 67% of individuals newly dx with HIV at OAPP testing sites in 2006-2008 were linked to care within 1 year (total of 679 new cases)
- Significant differences in LTC by race/ethnicity, gender, risk group, age, and testing site

Linkage to Care for Newly Diagnosed in LAC 2006-2008

HIV-positive Individuals, Jan 2006 - Jun 2008[1] (n = 1,202)

Characteristic	No.	%
Matched with HIV Case in HARS	1,043	86.8%
Previously Tested Positive	364	34.9%

[1] Individuals who tested confidentially at OAPP-funded sites using a rapid test

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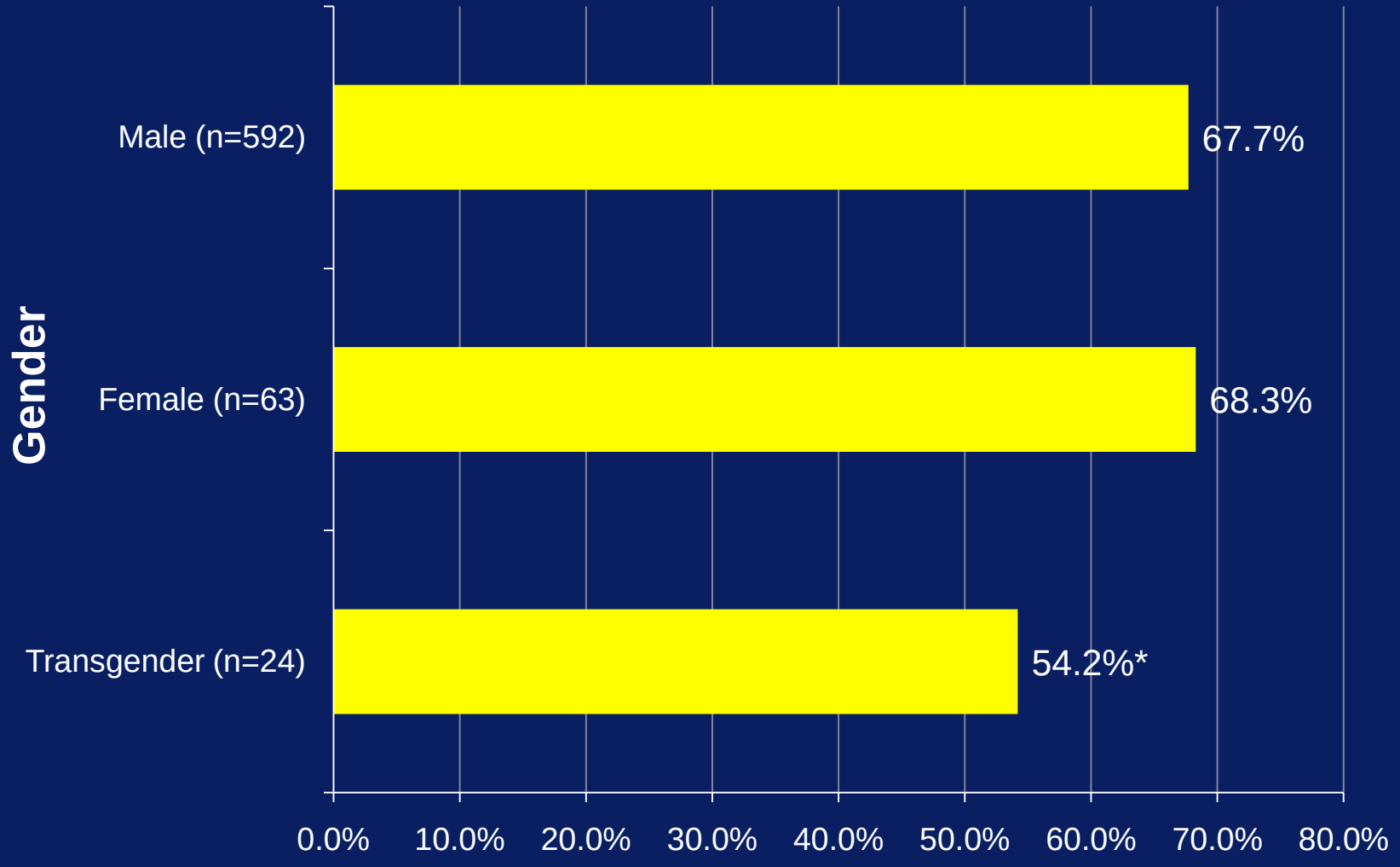
Linked to Care by Test Year, 2006-08

Linked to Care by Test Year, Jan 2006 -Dec 2008[1] (n = 807)

Characteristic	No.	%
Linked to Care[2]	528	65.4%
2006 (n=273)	164	60.1%
Within 3 months	123	45.1%
Within 6 months	18	6.6%
Within 1 year	23	8.4%
2007 (n=237)	163	68.8%
Within 3 months	138	58.2%
Within 6 months	17	7.2%
Within 1 year	8	3.4%
2008 (n=297)	201	67.7%
Within 3 months	177	59.6%
Within 6 months	13	4.4%
Within 1 year	11	3.7%

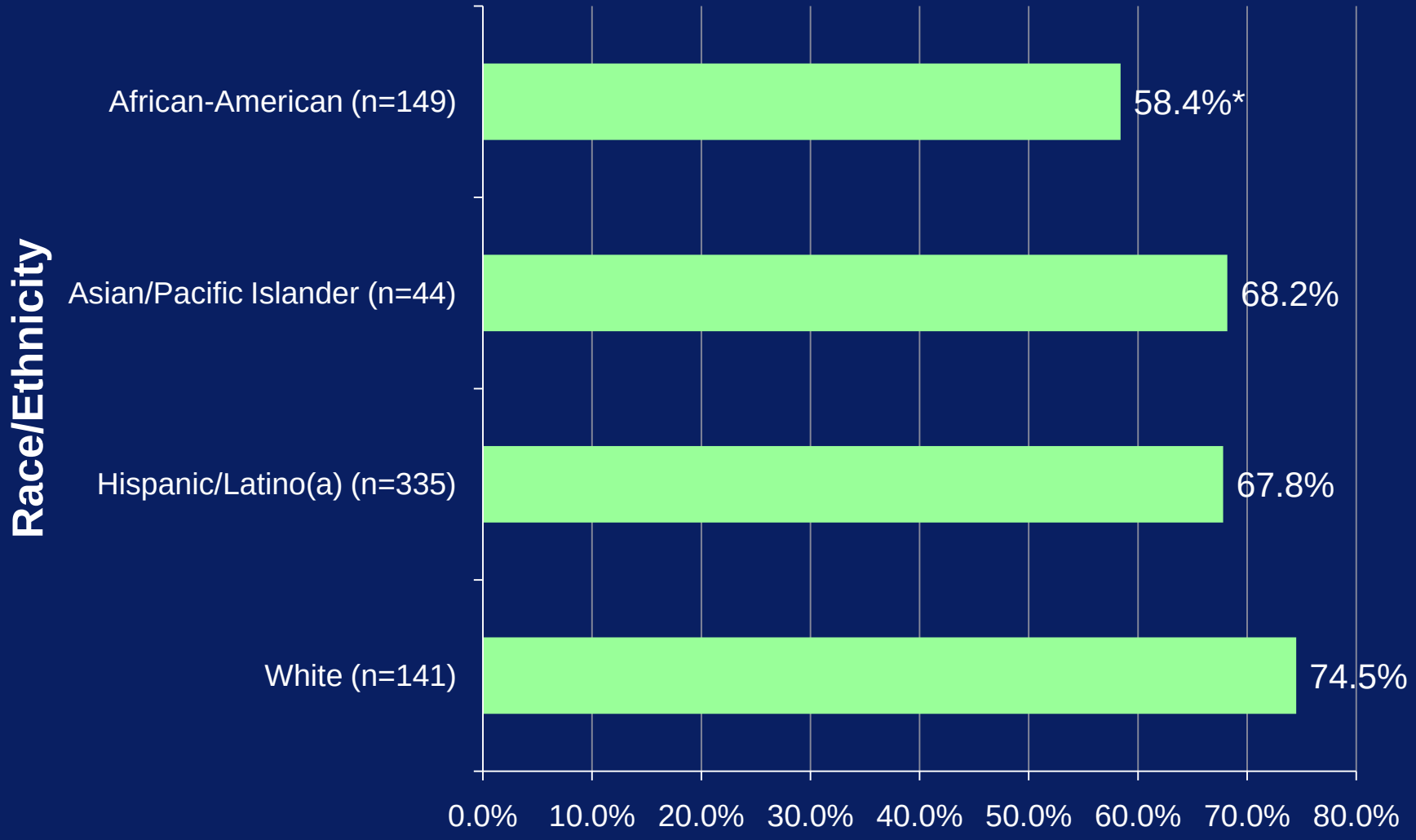
[1] Individuals who tested confidentially at OAPP-funded sites using a rapid test

Linked to Care by Gender, 2006-08



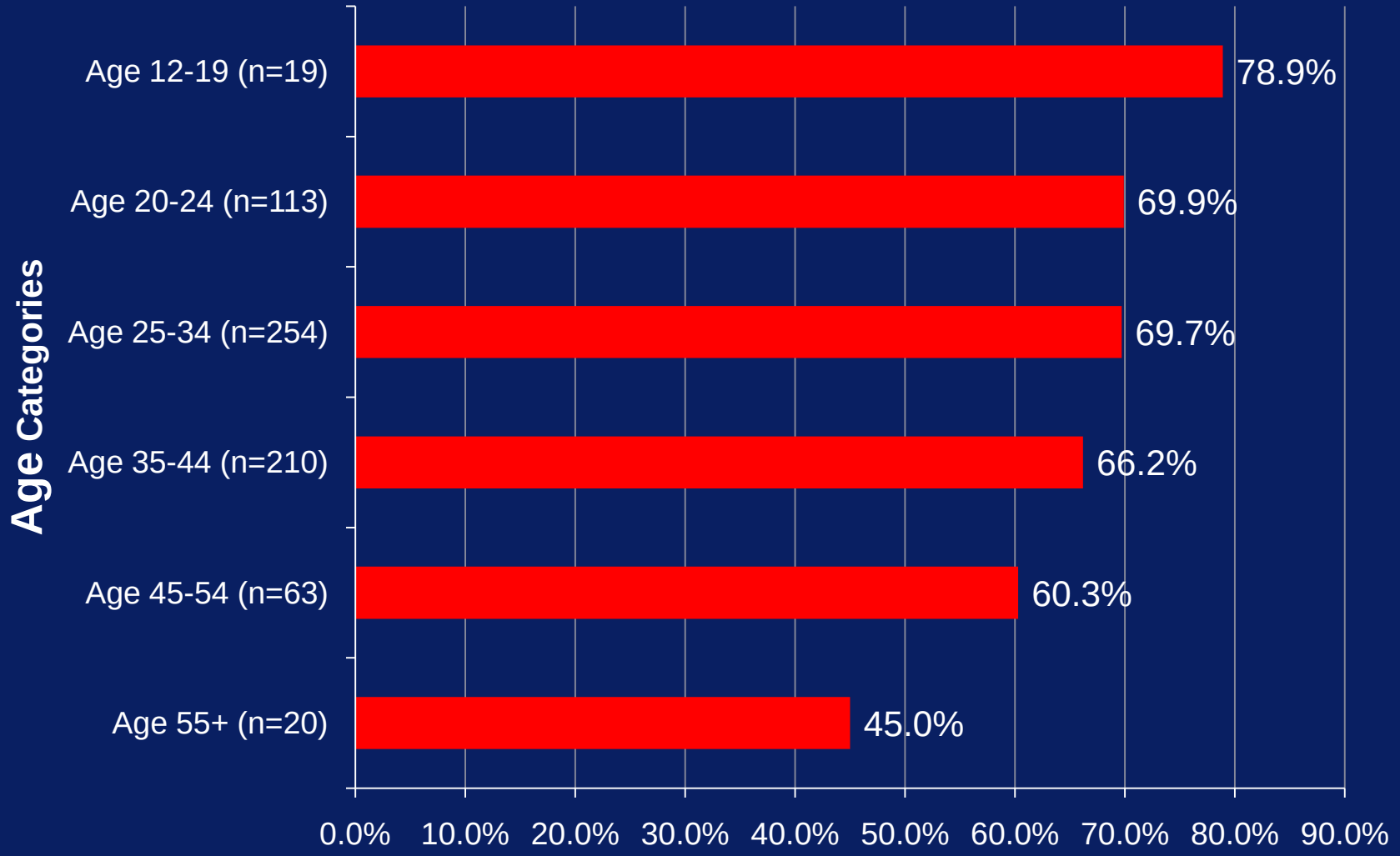
*Statistically significant, *p*=.05

Linked to Care by Race/Ethnicity[1], 2006-08

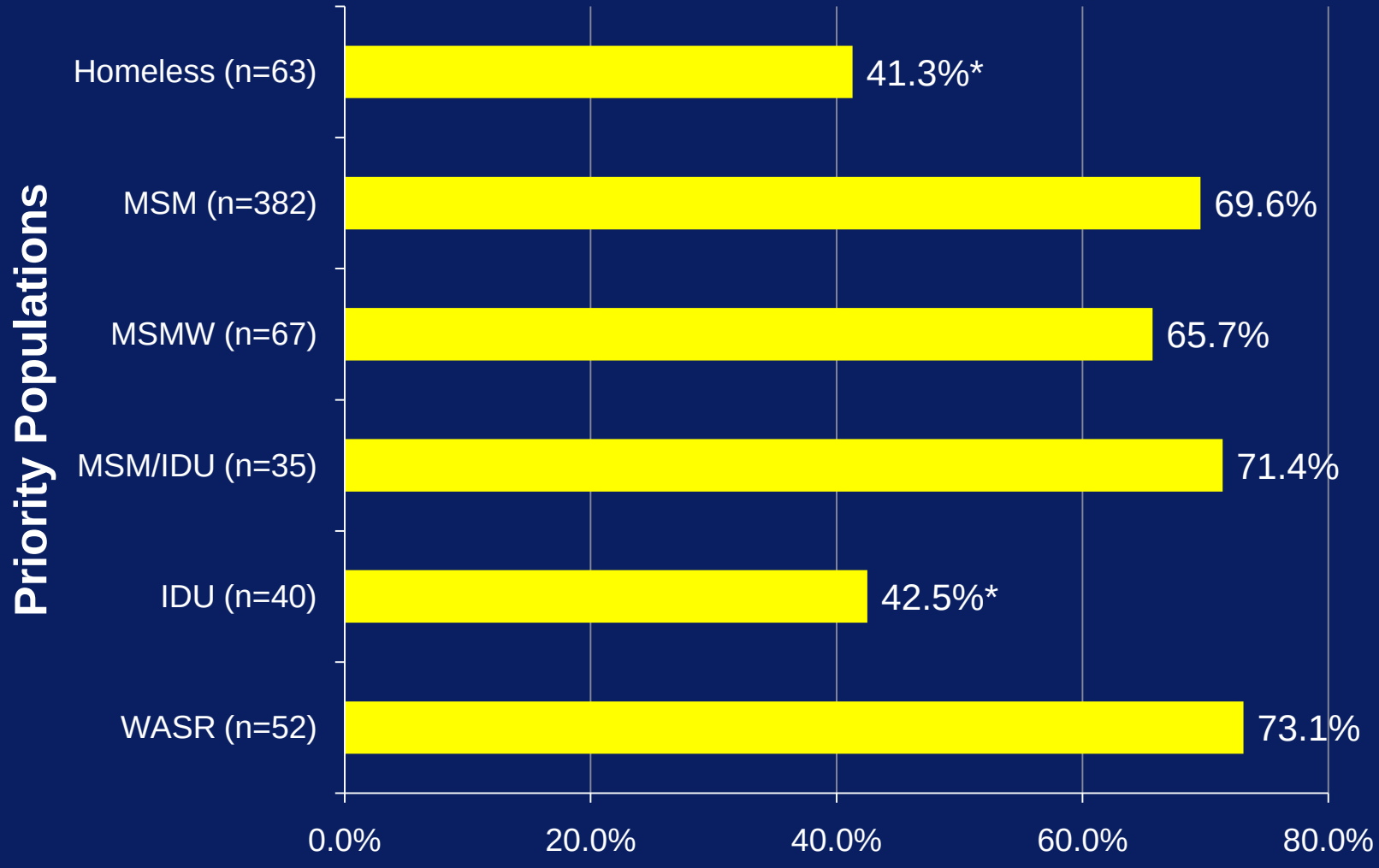


*Statistically significant, p=.05, [1]Native American/Alaska Native not included due to small sample size

Linked to Care by Age Group, 2006-08



Linked to Care by Priority Populations, 2006-08



*Statistically significant, *p*=.05

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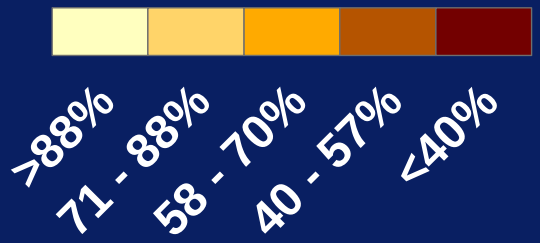
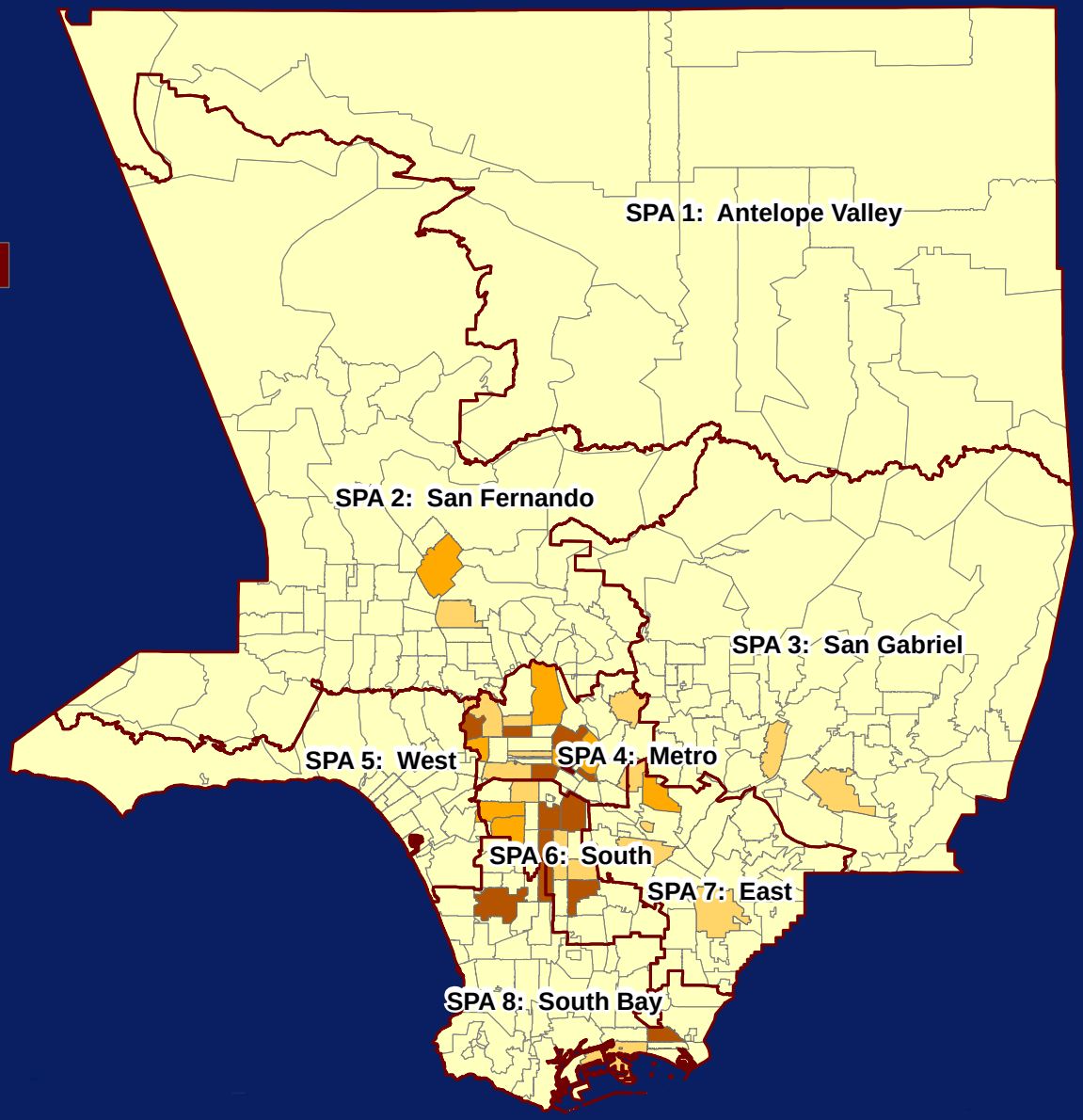
HIV-positive Individuals[1] Linked to Care[2], 2006-08 by Zip Code





[1]Newly-diagnosed individuals tested at OAPP-funded sites, identified in HIV surveillance data

[2]Matched cases in surveillance data not having a CD4 or viral load laboratory record zip codes with small numbers not included in analysis

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Data Source: HIV Epidemiology Program, 2010

HIV-positive Individuals[1] Linked to Care[2], 2006-08 by Zip Code

[1]Newly-diagnosed individuals tested at OAPP-funded sites, identified in HIV surveillance data

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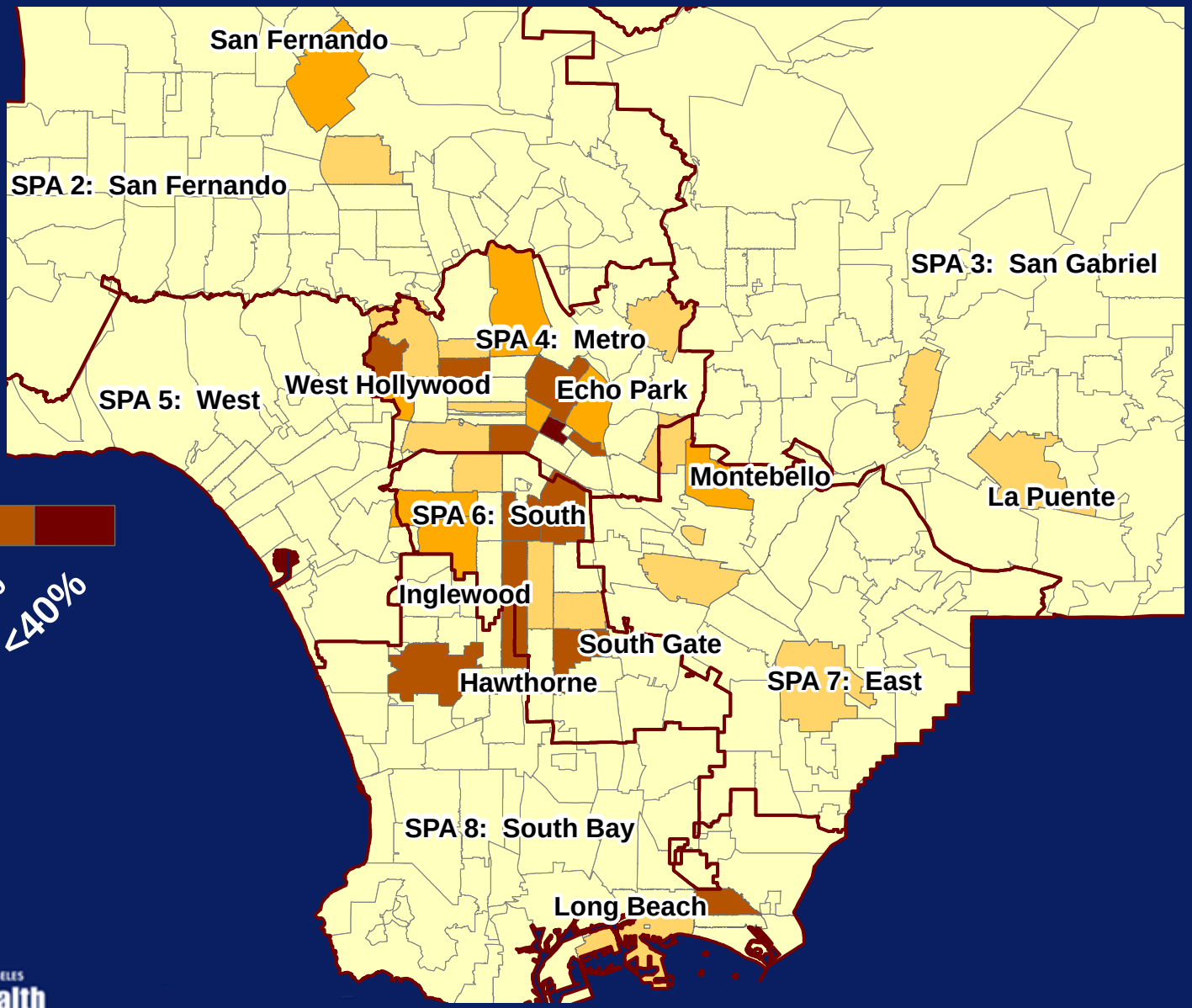

>88%
71 - 88%
58 - 70%
40 - 57%
<40%

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Data Source: HIV Epidemiology Program, 2010

1Newly-diagnosed individuals tested at OAPP-funded sites, identified in HIV surveillance data 2Matched cases in surveillance data not having a CD4 or viral load laboratory record

What are we doing to improve linkage to care in LAC?

Linkage to Care Activities

LTC ACTIVITY	START DATE	SUMMARY OF PROJECT / ACTIVITY
Incentivize LTC for HCT Programs	2005	Incentivize LTC at OAPP funded testing sites through fee structure that pays additional $80-120 for linking to HIV care (also incentivize disclosure and partner svcs)
HIV Rapid Testing Algorithm (RTA)	2006	RTA (2 rapid tests) used to deliver presumptive dx at testing episode and direct linkage to care w/out waiting for confirmatory testing. Currently RTA in shelters, routine testing sites, LAC jails
Routine Testing with same day linkage	2008	Implementing routine opt out HIV testing in clinical sites in high burden areas with same day linkage to care
Partner Services w/ARTAS LTC	2010	Partner Services PHI's trained to deliver 5 sessions of ARTAS model strength based CM to link all new positives and out of care back into HIV medical care
Youth focused Linkage Worker	2010	"Deputized" linkage worker trained to work with newly dx youth in LAC to link to care – uses testing data to ID and contact new cases in collaboration with providers

Linkage to Care Activities Cont'd

LTC ACTIVITY	START DATE	SUMMARY OF PROJECT / ACTIVITY
Jail based Transitional Case Management (TCM)	2000	TCM in LAC jails work with all HIV+ inmates to establish LTC for medical care and other services upon release
HIV non-occupational Post-Exposure Prophylaxis (nPEP)	2010	Pilot of HIV nPEP with intensive RR counseling delivered to individuals with high risk HIV exposure, includes HIV testing and direct linkage to HIV care co-located with PEP site.
Peer Navigation	2008	2 NIH funded RCTs to evaluate effectiveness of Peer Navigation to improve TLC+ with cost analysis. Studies targeting 2 populations with historically poor LTC in LAC: (1) HIV+ released from Jail (2) MSM of color.

CARE

Retention in Care*

One visit to doctor ≠ ongoing HIV care

- If our goal is to reduce viral loads we must also improve retention in care
- Of newly dx HIV+ at OAPP testing sites in 2007-2008 who were linked to care, 81% were retained in care for 12 mo after diagnosis
- Of existing patients in LAC Ryan White HIV care system in 2008-2009 (n= 12,725), 82% were retained in care over this period

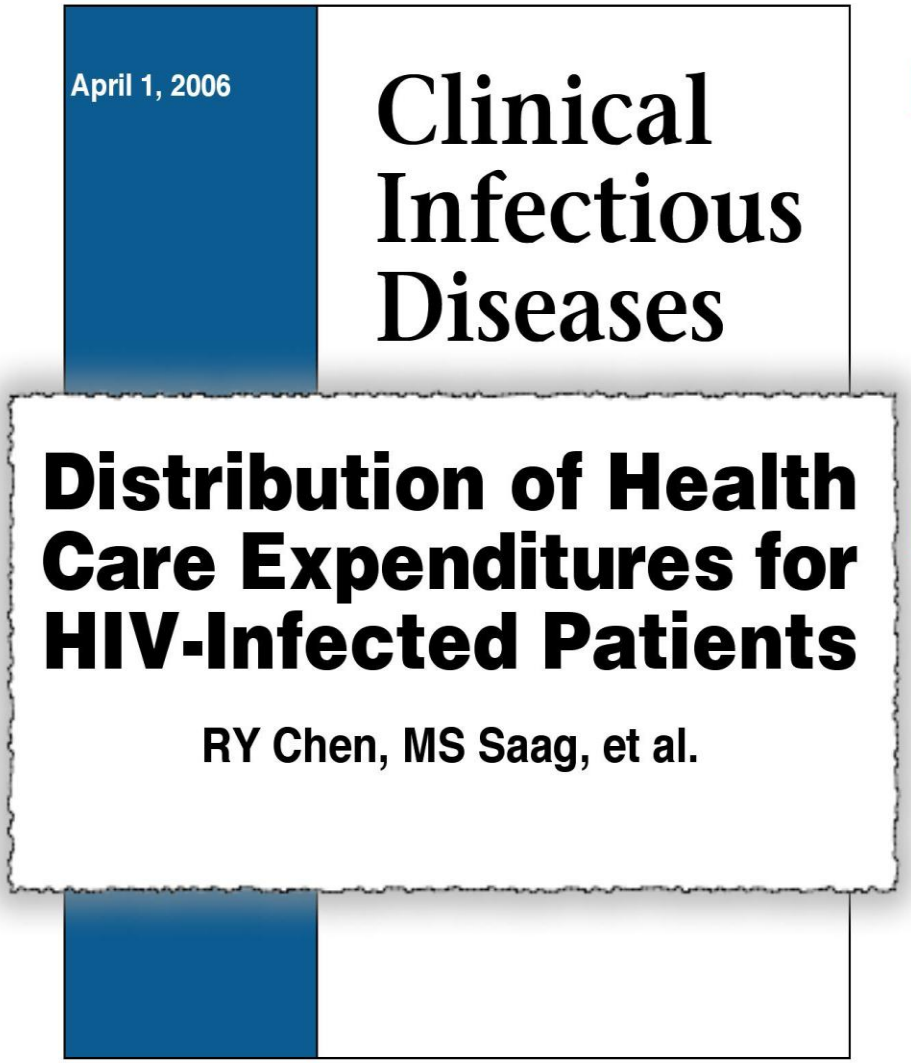
*Defined at 2 visits in 12 month period at least 3 months apart (HRSA/HAB)

Survival of some HIV+ adults same as general population

Truncation for Duration of Follow-up, Yrs	Median Time Spent With CD4+ Cell Count ≥ 500 cells/mm^3 After Truncated Duration of Follow-up, Yrs (IQR)	Deaths, n	SMR (95% CI) SMR<1 =general population
0 (n = 1208)	4.5 (2.1-7.0)	37	2.5 (1.8-3.5)
1 (n = 1156)	4.2 (2.1-6.4)	29	2.1 (1.4-3.1)
2 (n = 1083)	4.0 (2.1-5.6)	26	2.2 (1.4-3.2)
3 (n = 1031)	3.5 (1.8-4.8)	22	2.1 (1.3-3.2)
4 (n = 967)	3.0 (1.5-3.8)	18	2.1 (1.3-3.4)
5 (n = 864)	2.4 (1.4-3.0)	12	1.9 (1.0-3.2)
6 (n = 763)	1.6 (1.0-2.2)	2	0.5 (0.1-1.6)
7 (n = 610)	0.9 (0.5-1.3)	1	0.5 (0.0-2.6)

Lewden C, et al. J Acquir Immune Defic Syndr. 2007;46:72-77.

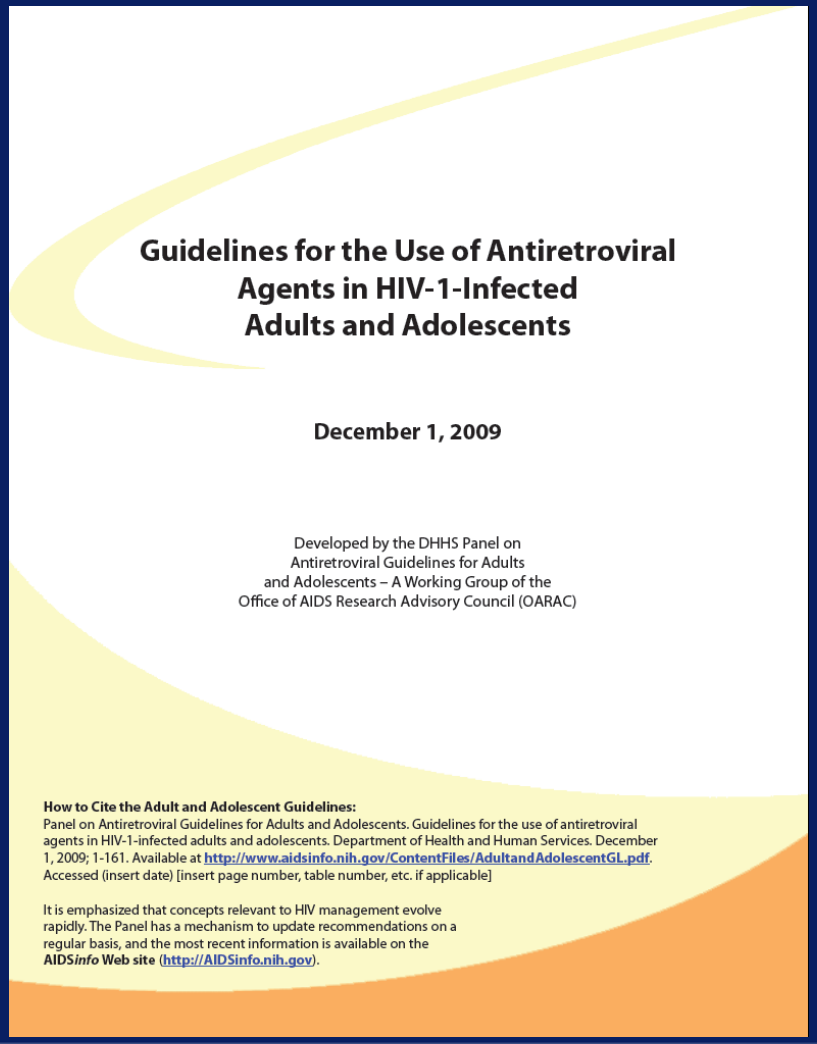
Care of HIV-Infected People is Much Costlier Late in Course of Disease



- Annual cost of care at U. of Alabama-Birmingham HIV Clinic
  - CD4 count <50 $36,553
  - CD4 count >350 $13,885
- 2.6-fold difference, primarily because of increased expenditures for nonantiretroviral medication and hospitalization

+ Plus

Changes in Guidelines



Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents

December 1, 2009

Developed by the DHHS Panel on Antiretroviral Guidelines for Adults and Adolescents – A Working Group of the Office of AIDS Research Advisory Council (OARAC)

How to Cite the Adult and Adolescent Guidelines:
Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. December 1, 2009; 1-161. Available at http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. Accessed (insert date) [insert page number, table number, etc. if applicable]

It is emphasized that concepts relevant to HIV management evolve rapidly. The Panel has a mechanism to update recommendations on a regular basis, and the most recent information is available on the **AIDS*info* Web site** (http://AIDSinfo.nih.gov).

- **Treat patients with CD4 counts between 350 and 500 cells/mm^3 (A/B-II)**
- **Patients with CD4 counts >500 cells/mm^3 (B/C-III)**
- **Regardless of CD4 count, treat the following patients:**
  - pregnancy **(AI)**
  - HIV-associated nephropathy **(AII)**
  - HBV co-infection when treatment of HBV is indicated **(AII)**

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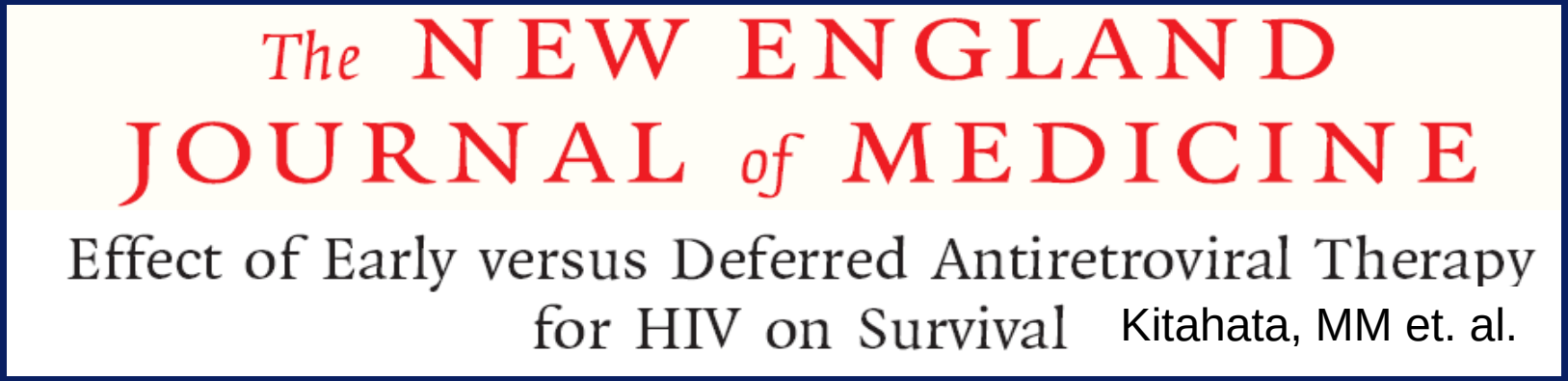


- **Objective**: Determine optimal ART initiation for ART naïve
- 17,517 patients in US and Canada from 1996-2005
- CD4 351-500: 8,362 pts, 25% initiated ART, 75% deferred
  - **Deferred group: 69% increase in risk of death** (RR 1.69; 95% CI, 1.26 - 2.26)
- CD4 >500: 9,155 pts, 24% initiated ART, 76% deferred
  - **Deferred group: 94% increase in risk of death** (RR 1.94: 95% CI, 1.37-2.79)
- **Conclusions:** Early ART initiation before CD4 count fell significantly improved survival vs. deferred therapy groups

N Engl J Med 2009;360:1815-26

The New England Journal of Medicine

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

VOLUME 322 APRIL 5, 1990 NUMBER 14

Early Treatment for HIV: the Time has Come

G.H. Friedland

The New England Journal of Medicine

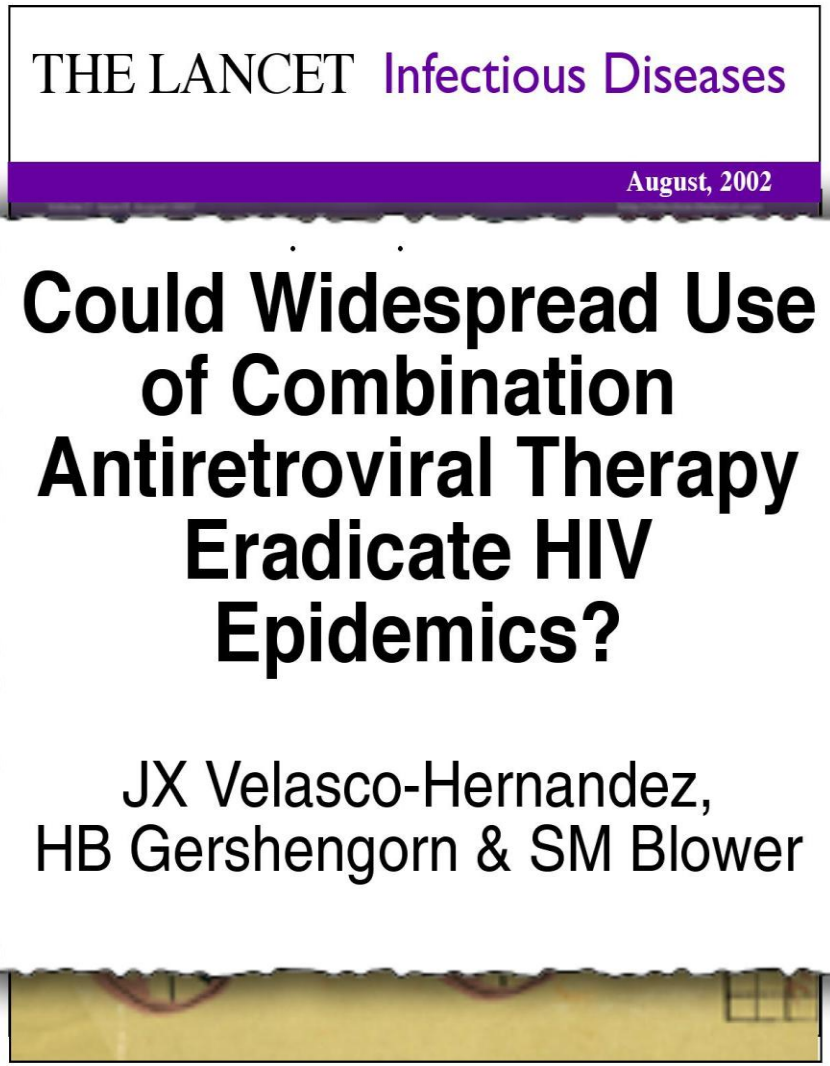
Established in 1812 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY

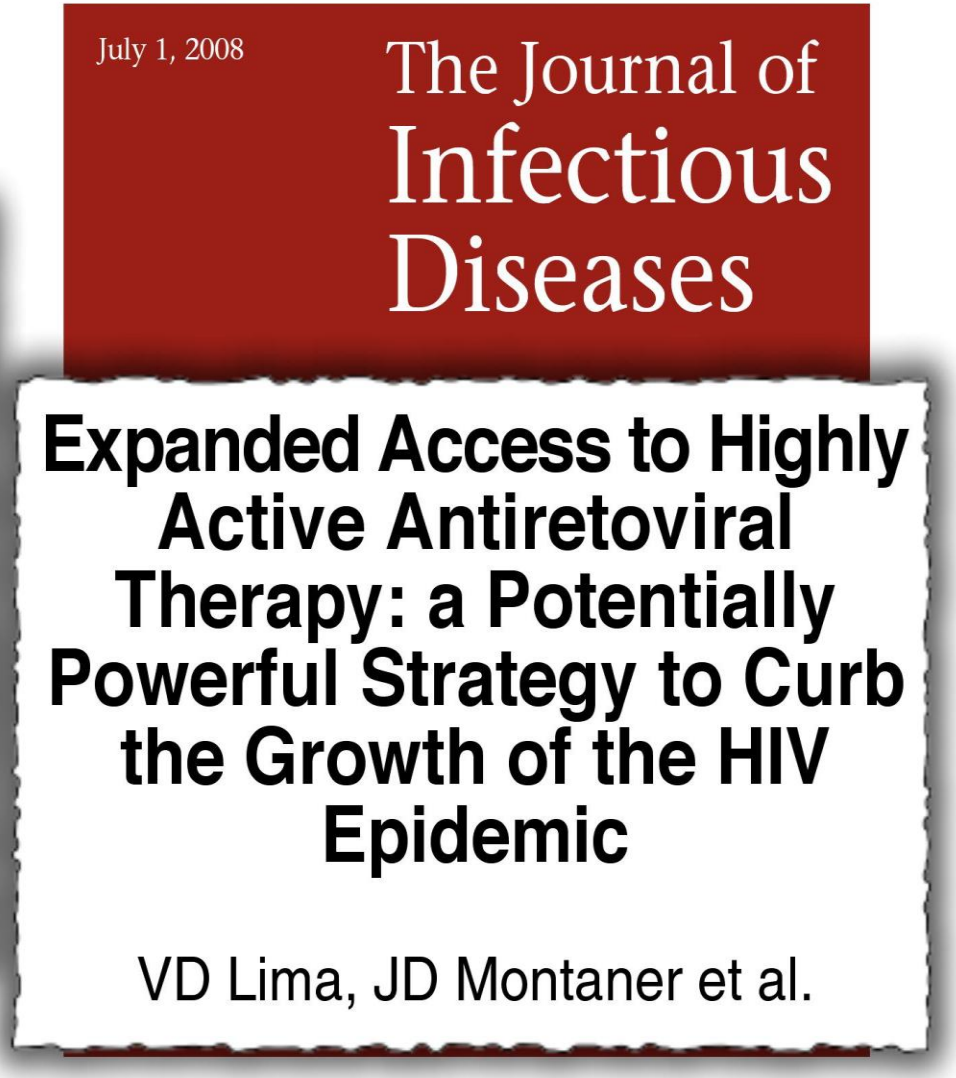
VOLUME 333 AUGUST 17, 1995 NUMBER 7

Time to Hit HIV, Early and Hard

D.D. Ho

Expanded HIV Treatment to Slow Transmission: Selected Studies





How could we measure effectiveness of TLC+?

Reduced Community Viral Load

Reduced Transmission

Reduced Incident Infections

Community Viral Load (cVL)*

Population-based measure of a community's viral burden

Potential biologic indicator of effectiveness:

- Antiretroviral treatment
- HIV prevention

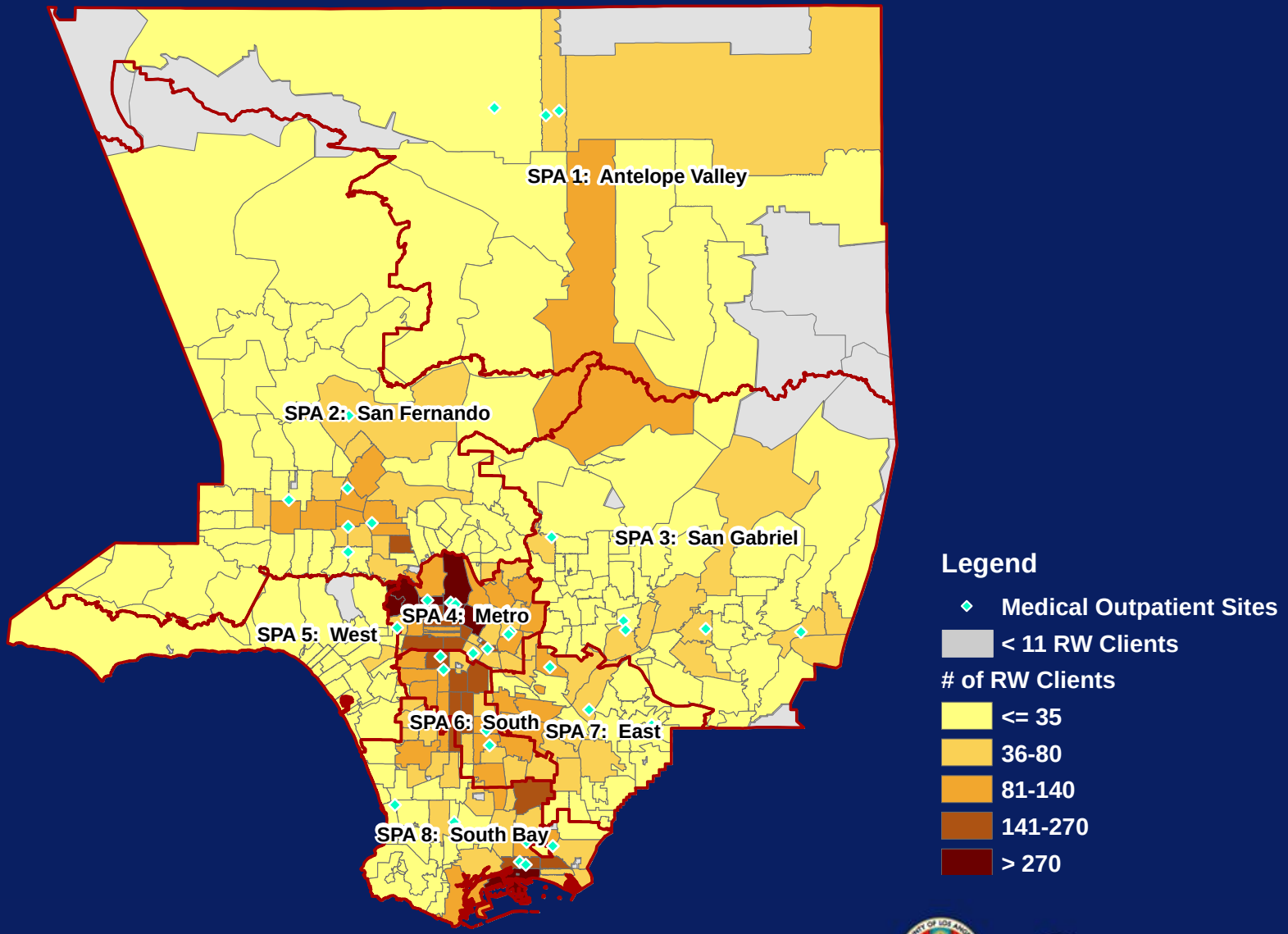
*Mean cVL calculated as mean of most recent VL for individuals in LAC surveillance system of HIV care system in a given time period

Community Viral Load (cVL)*

- Reducing HIV viral load = strategy to improve individual health outcomes as well as reduce HIV transmission (cVL)
- Mapping cVL shows significant geographic variations (“hot spots”) throughout LAC
- Mean VL differs by age, race/ethnicity, risk group, insurance status, incarceration history
- cVL and individual VL reduction is an important outcome for HIV prevention and care programs, and informs targeted prevention services

*Mean cVL calculated as mean of most recent VL for individuals in LAC surveillance system or RW care system in a given time period

of RW Clients by Resident Zip-Code



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10)*: Limited to Zip-Codes w/ > 10 RW clients.

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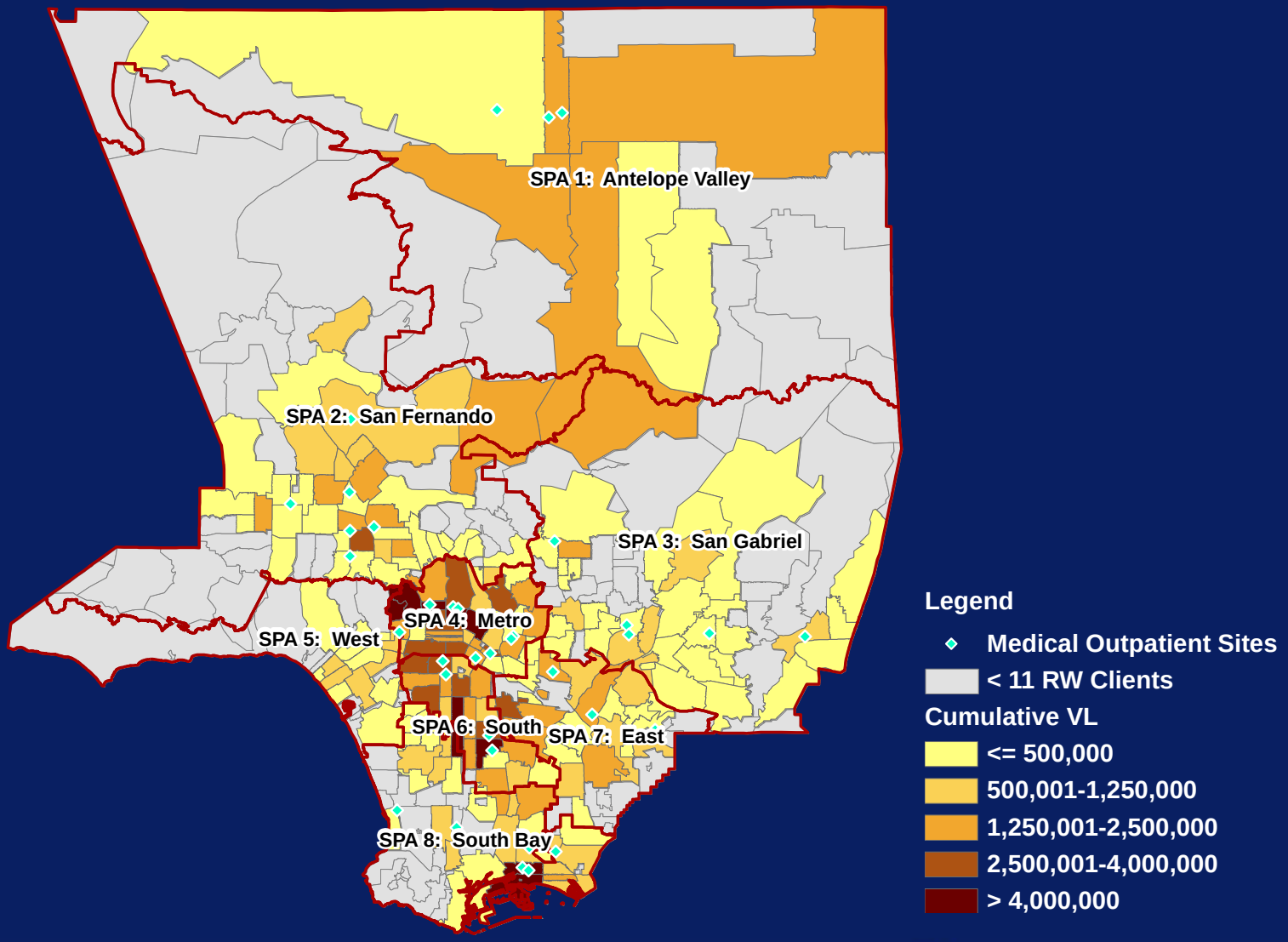
Cumulative VL* by Resident Zip-Code



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*

* Data limited to zip-codes with > 10 RW clients that had one VL measure – analysis based on client's most recent viral load.

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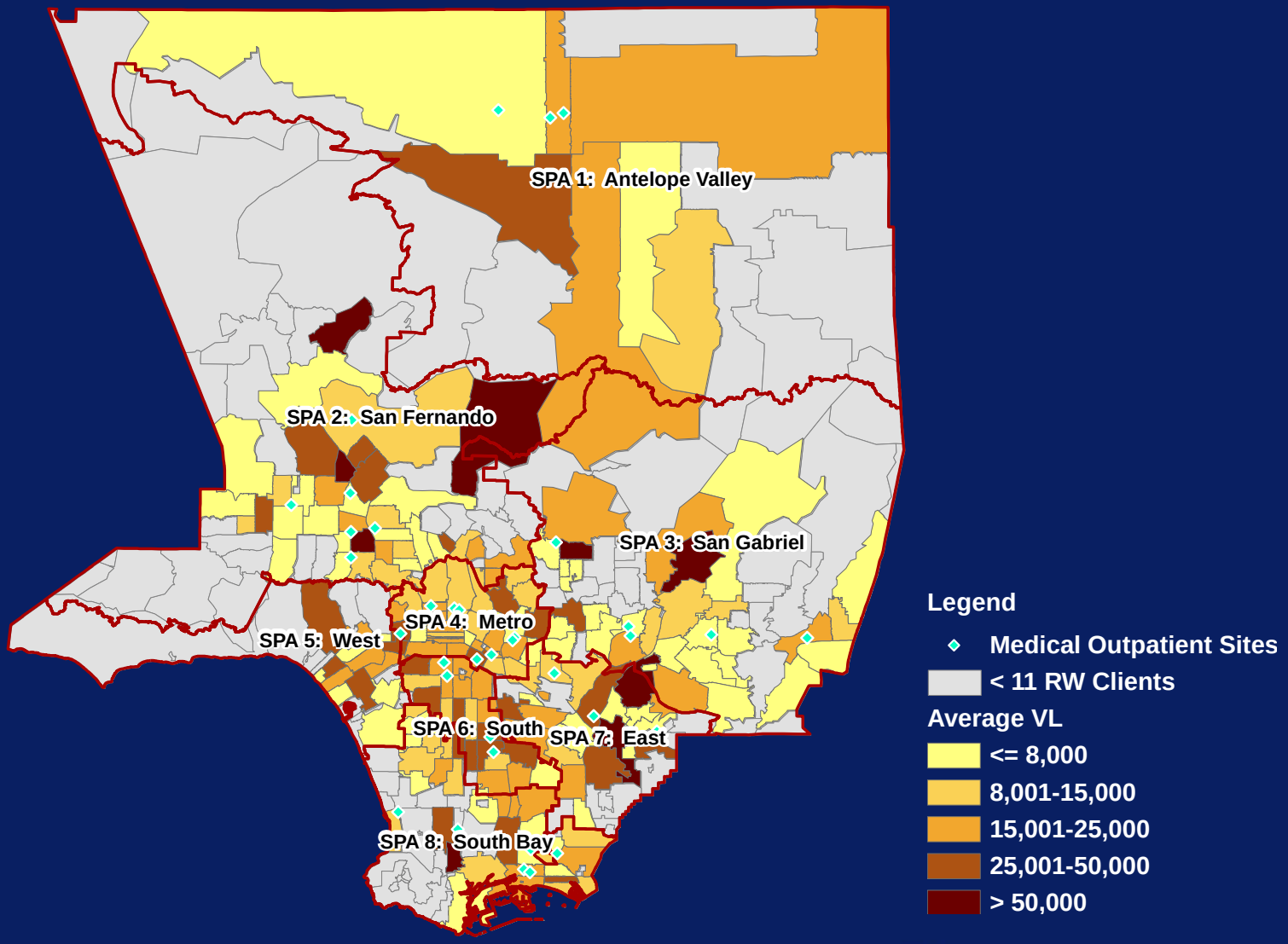
Average VL* by Resident Zip-Code



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*

* Data limited to zip-codes with > 10 RW clients that had one VL measure – analysis based on client's most recent viral load.

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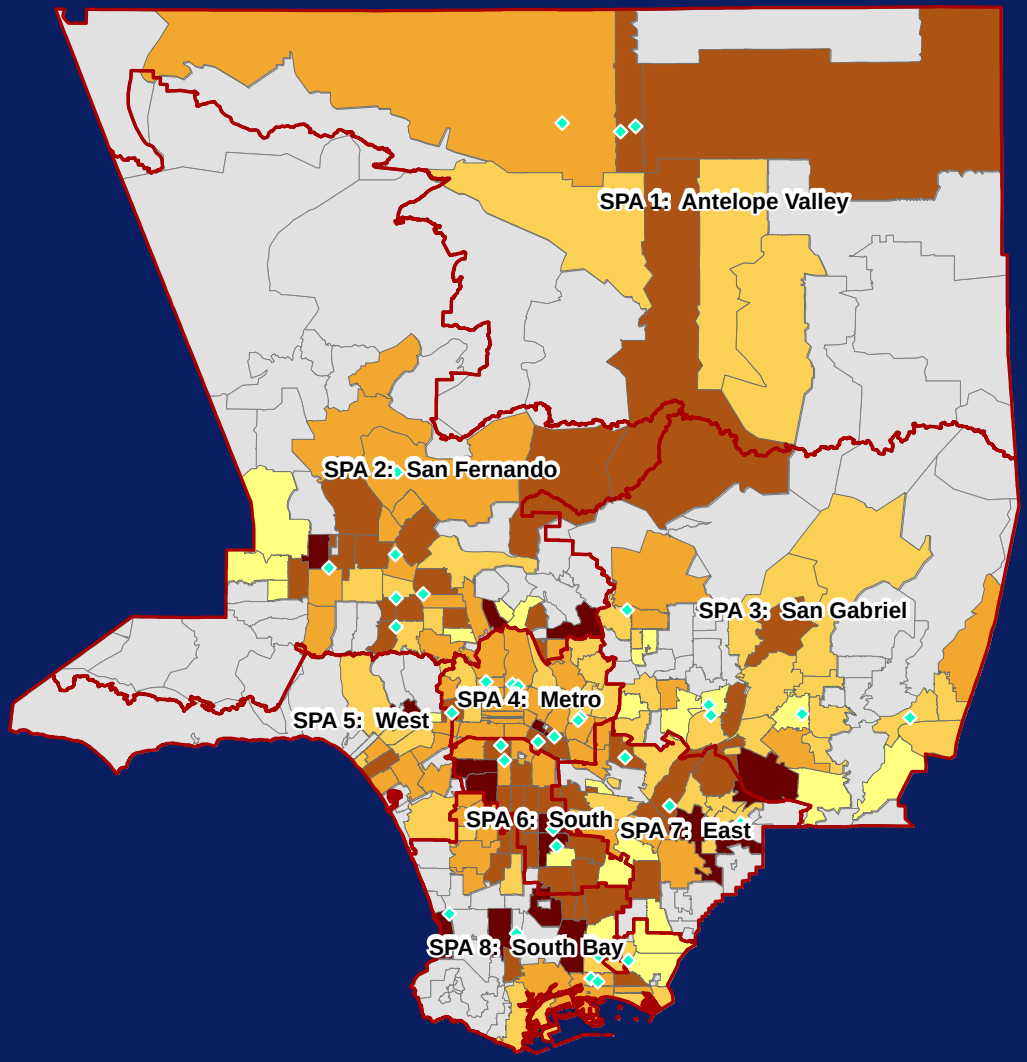
Undetectable VL* by Resident Zip-Code



Legend

- Medical Outpatient Sites

Undetectable VL

- <= 60%
- 61-69%
- 70-75%
- 76-82%
- > 82%
- < 11 RW Clients

Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):* Data limited to zip-codes with > 10 RW clients that had one VL measure – analysis based on client's most recent viral load.

* Defined as < 200 copies/ml.

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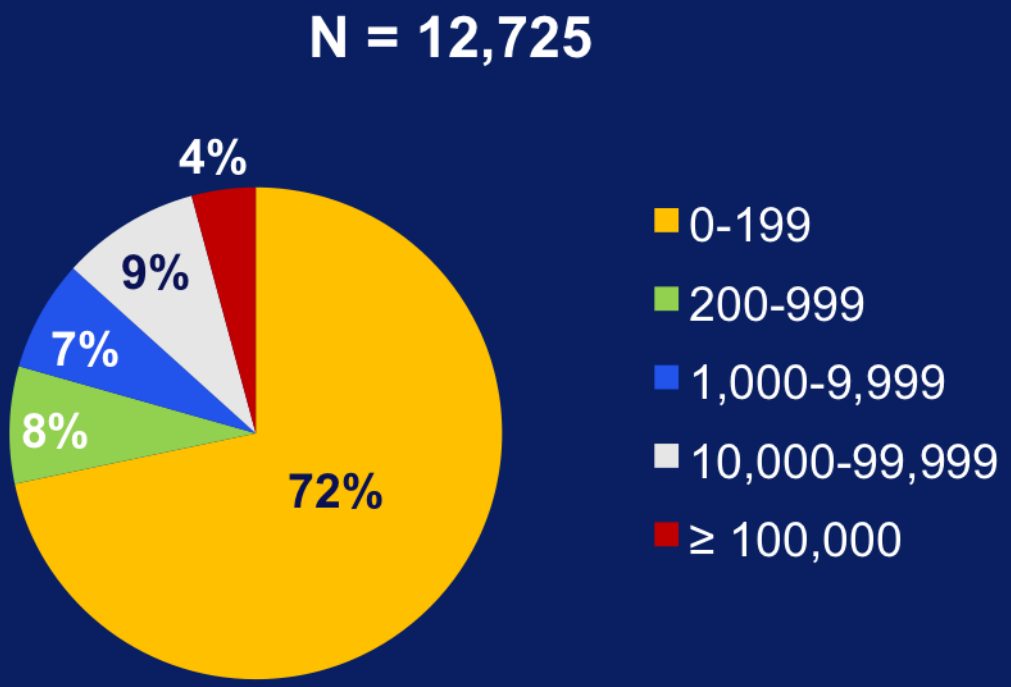
HIV-1 Viral loads among RW Clients

- 14,875 RW clients database had 1 or more medical outpatient (MOP) visit in YR 19.
  - Of that, 12,725 (~86%) had at least one viral load test during that year.



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*
Data limited to RW Client w/ 1 or more MOP visit.

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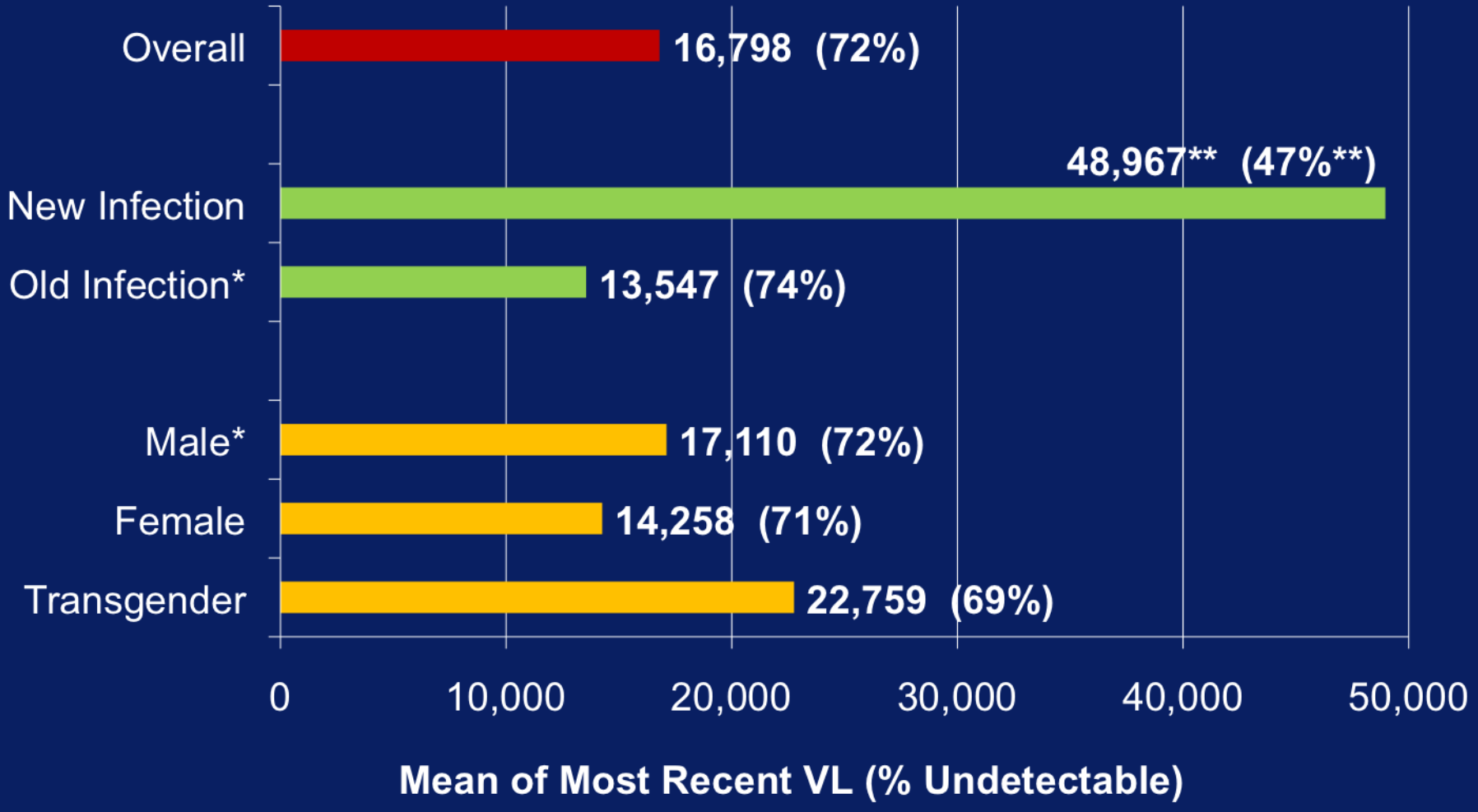
Mean Viral Load & Demographics



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*
Data limited to RW Client w/ 1 or more MOP visit.
* Indicates reference/comparison group
** Significantly different from reference group (p-value < 0.05)

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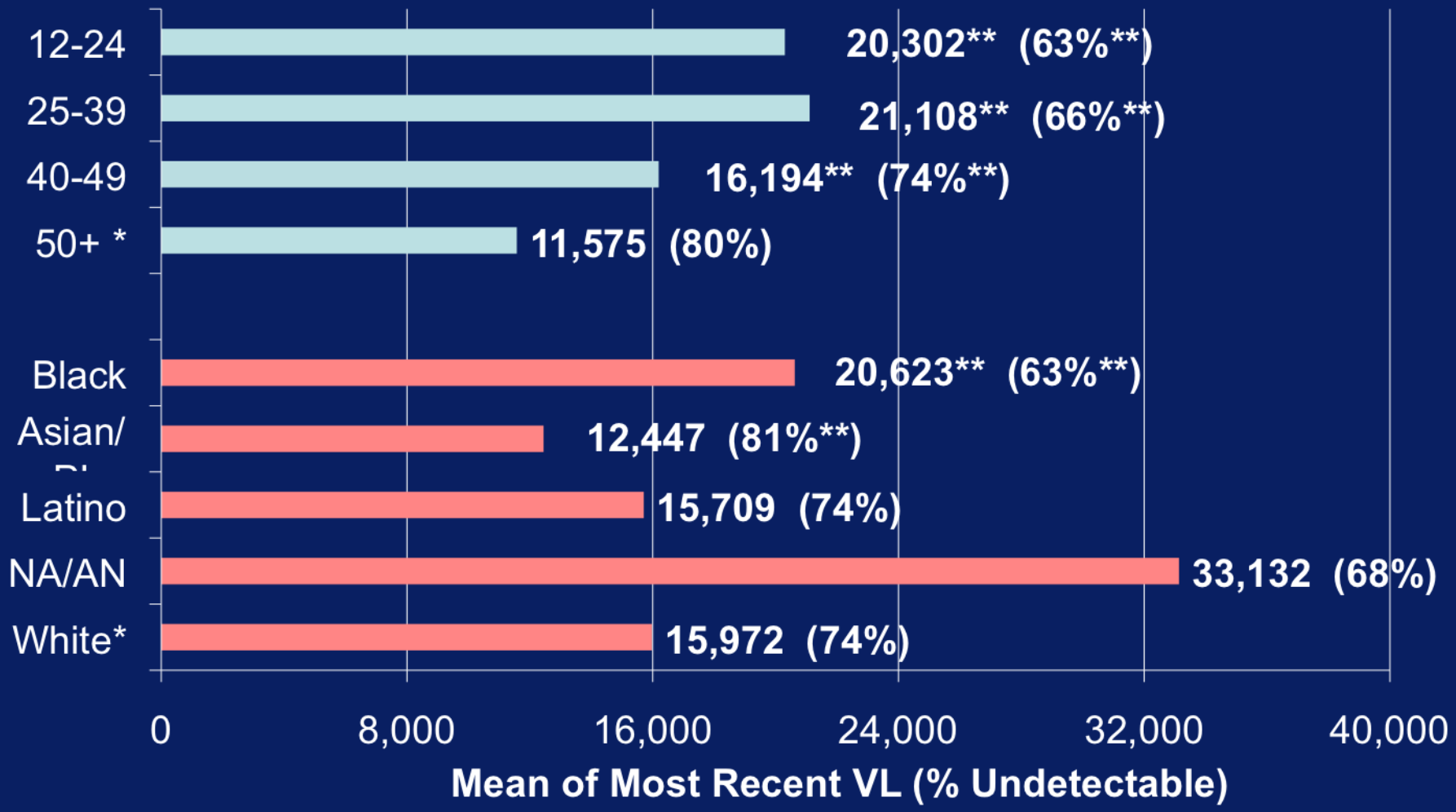
Mean Viral Load & Demographics



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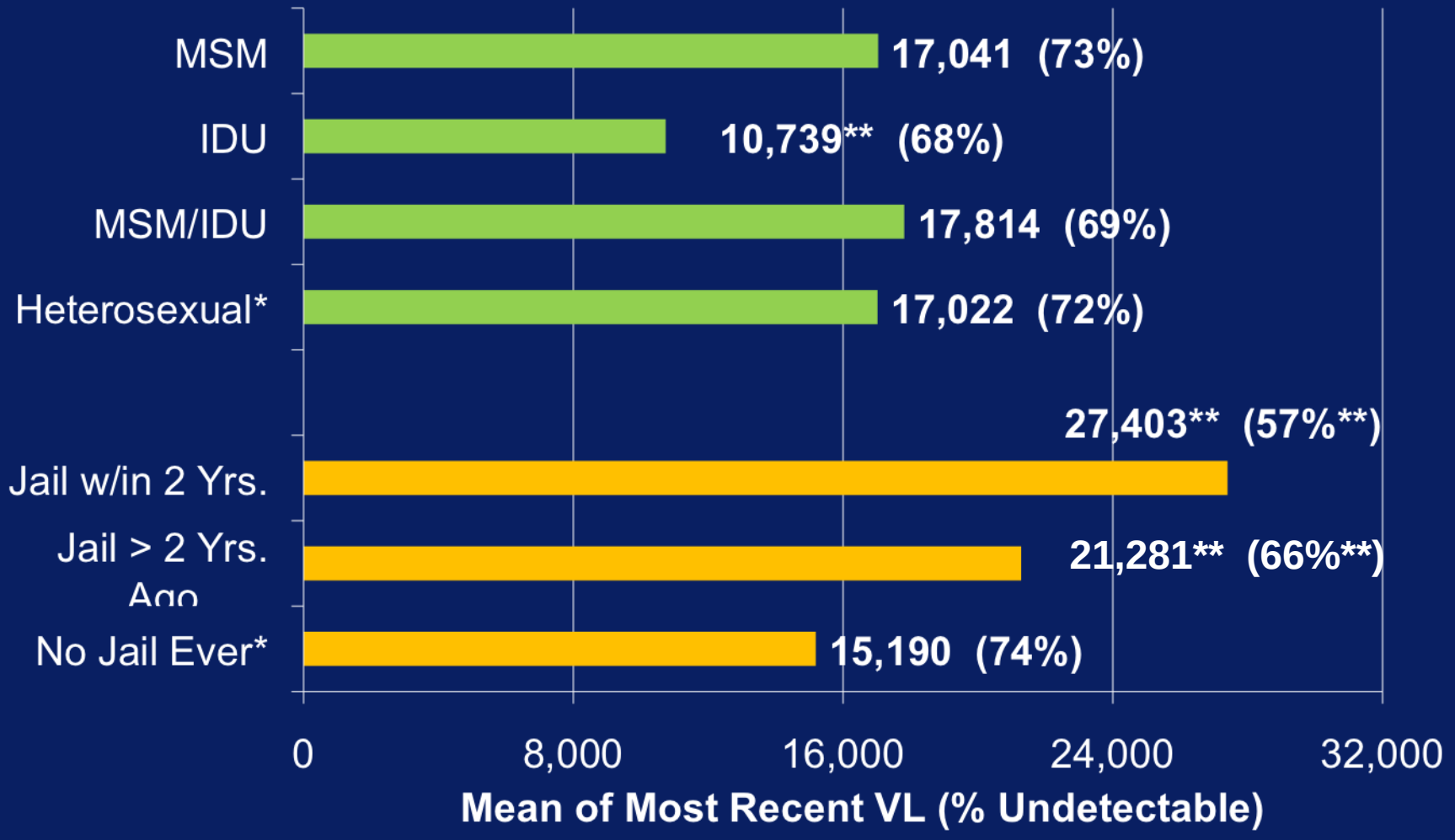
Mean Viral Load & Risk Behaviors



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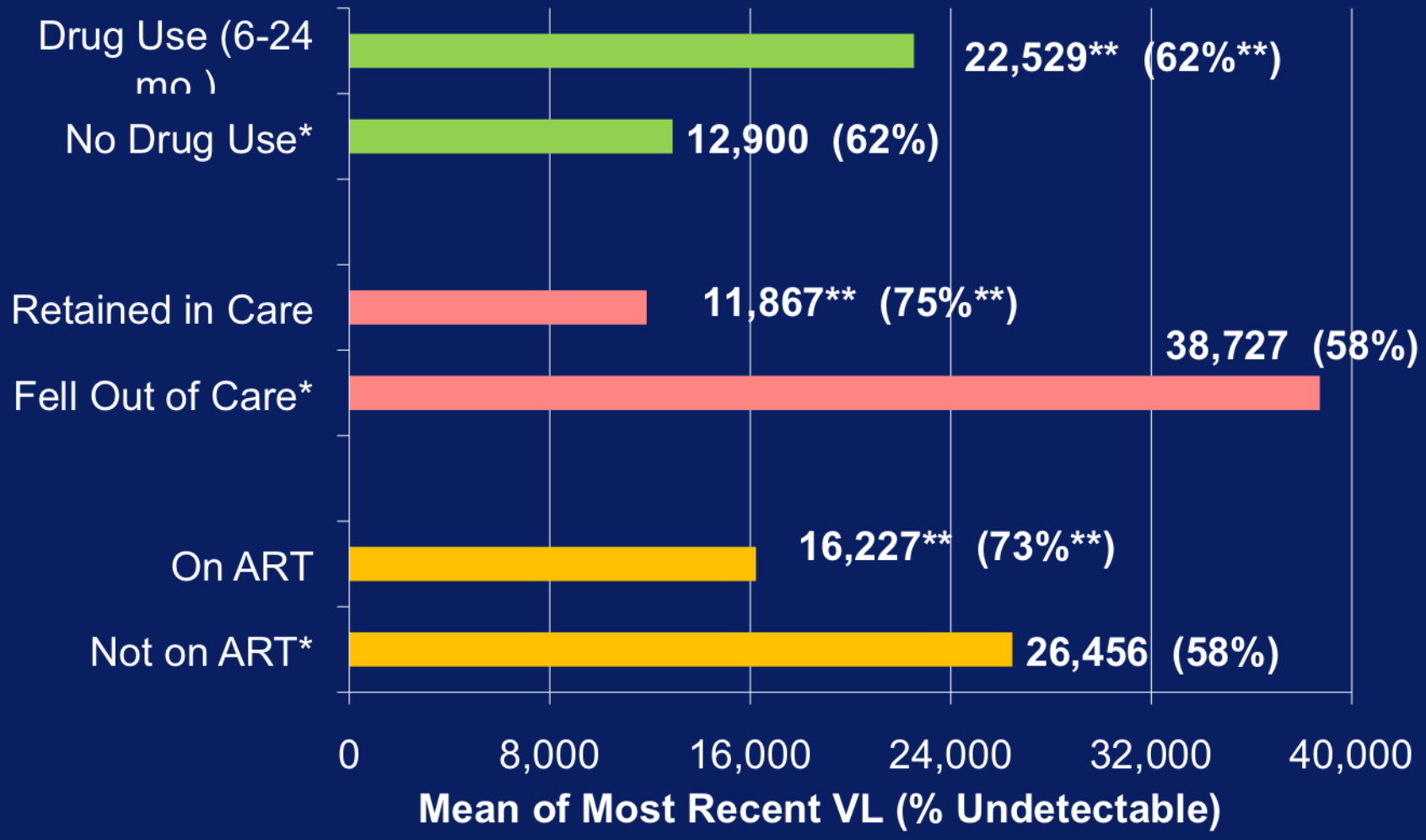
Mean Viral Load & Risk Behaviors



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* Indicates reference/comparison group
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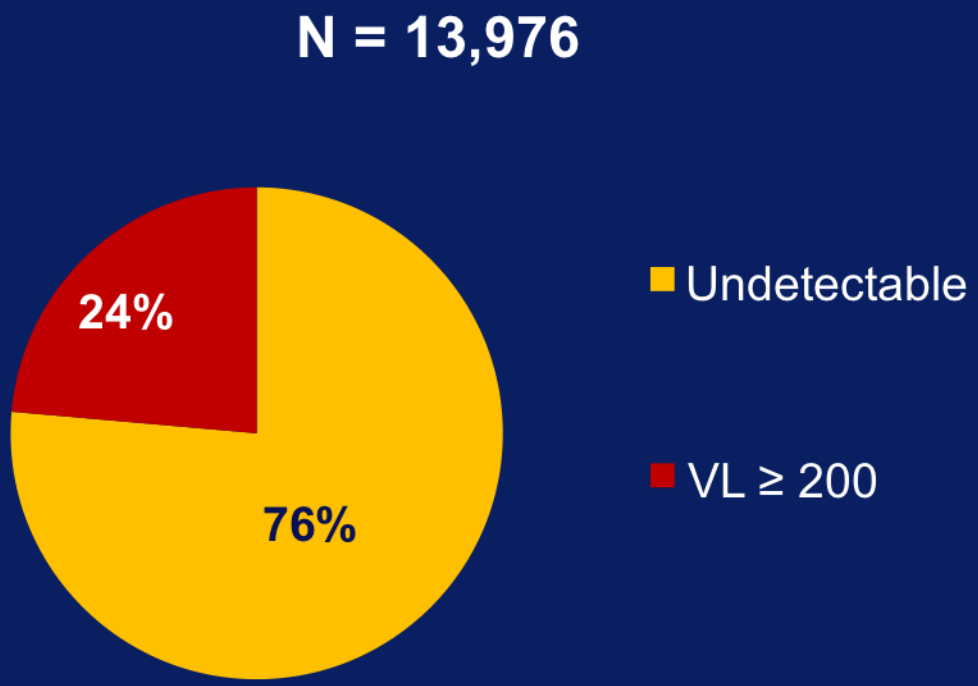
Viral Load of RW Clients on ART

- Among RW Clients w/ 1 or more MOP visit, 13,976 (~94%) are on antiretroviral therapy.



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*
Data limited to RW Client w/ 1 or more MOP visit.

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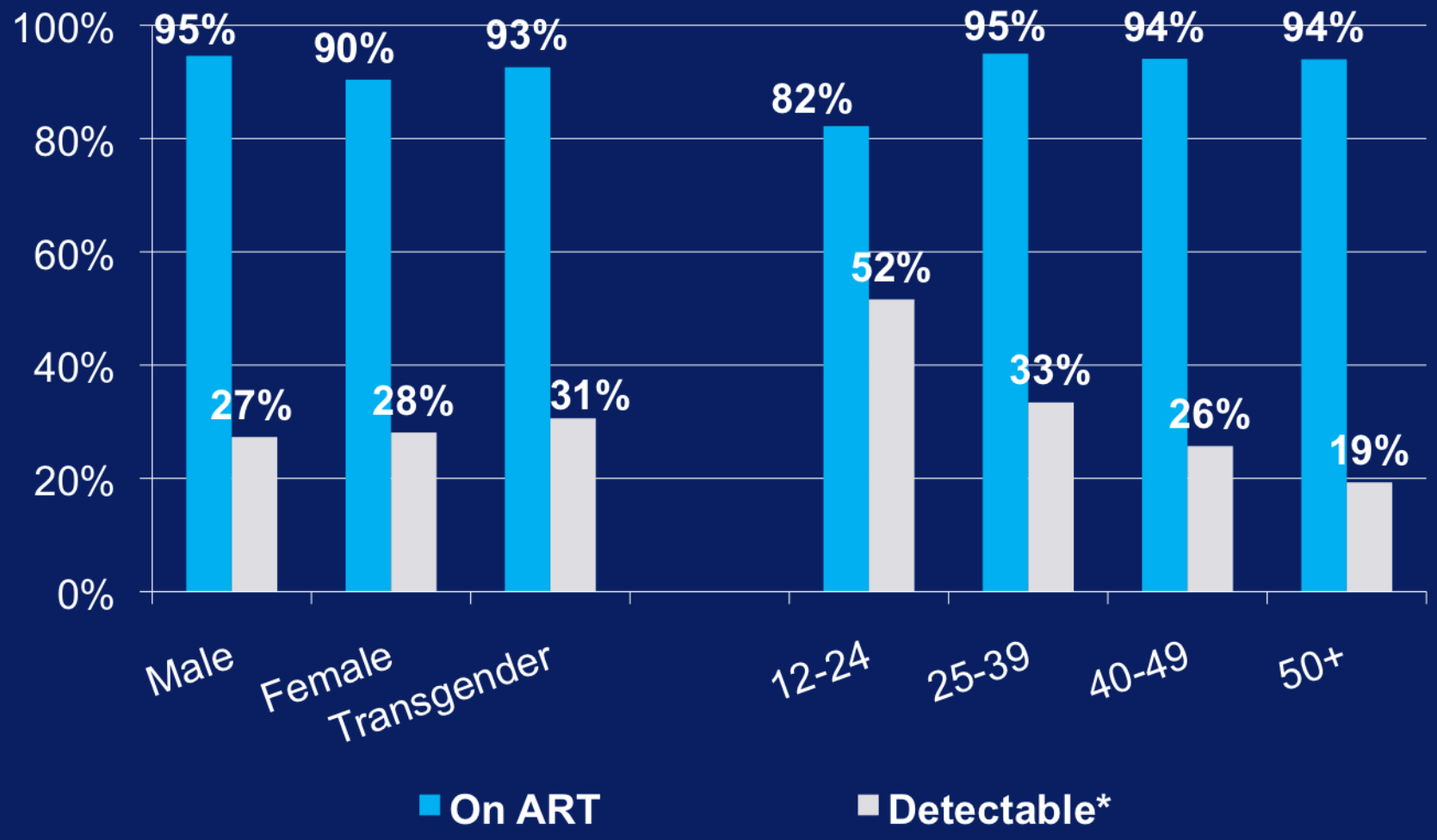
ART Use in RW System



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*
Data limited to RW Client w/ 1 or more MOP visit.
* Detectable is a subset of those on antiretroviral therapy with >200 copies VL.

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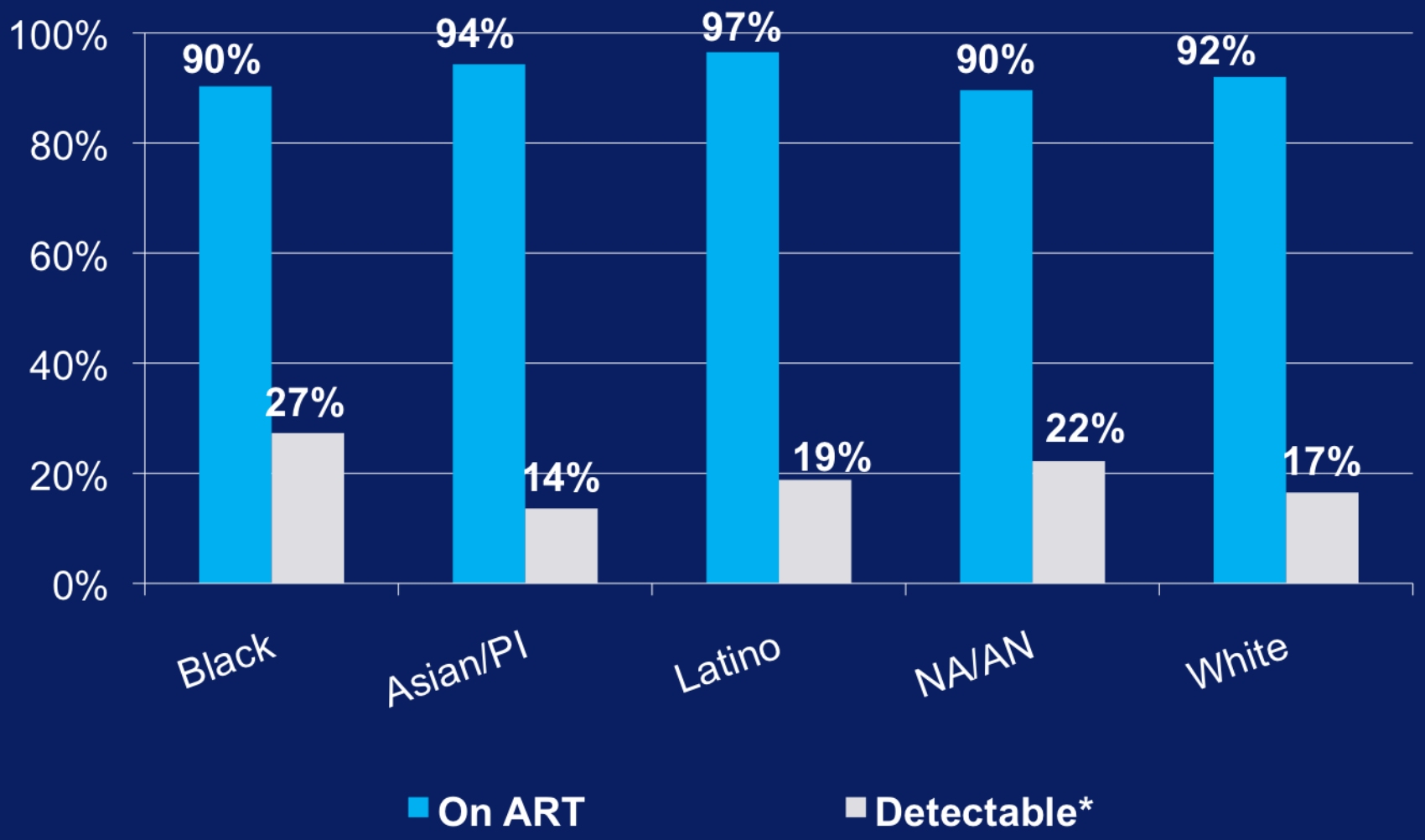
ART Use in RW System



Source: *Casewatch YR 19 (Feb. '09 – Mar. '10):*
Data limited to RW Client w/ 1 or more MOP visit.
* Detectable is a subset of those on antiretroviral therapy with > 200 copies VL.

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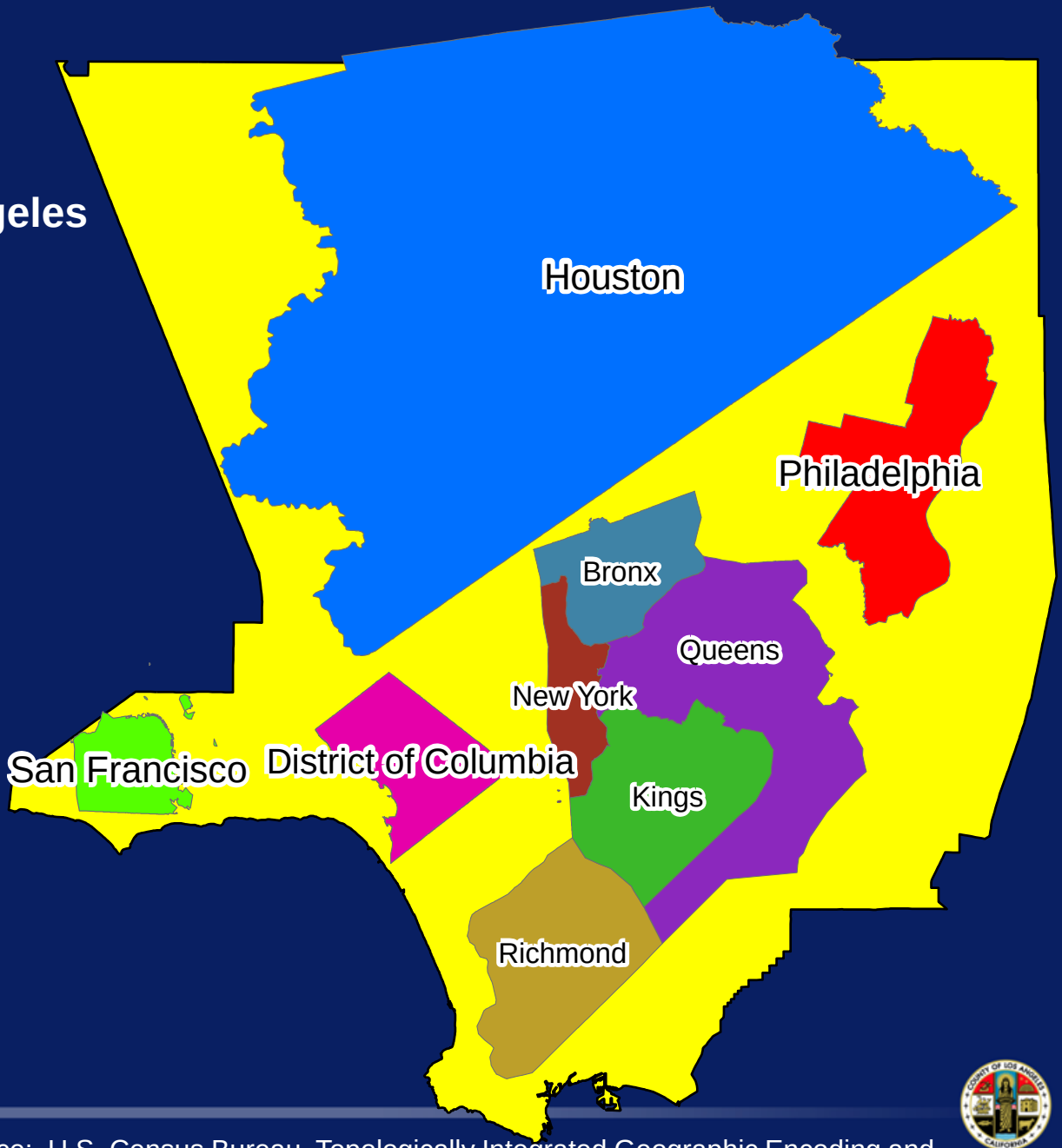
Challenges to TLC+

Los Angeles County



Data Source: U.S. Census Bureau, Topologically Integrated Geographic Encoding and Referencing system, 2009. Maps Drawn at 1:750,000 scale.

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Challenges to TLC+

- Geography of LAC
- Fragmented health care system
- Resources to scale up components
- HIV stigma and homophobia
- Will not eliminate epidemic alone – need highly active HIV prevention

Simply Testing and Treating will not eliminate the epidemic…..

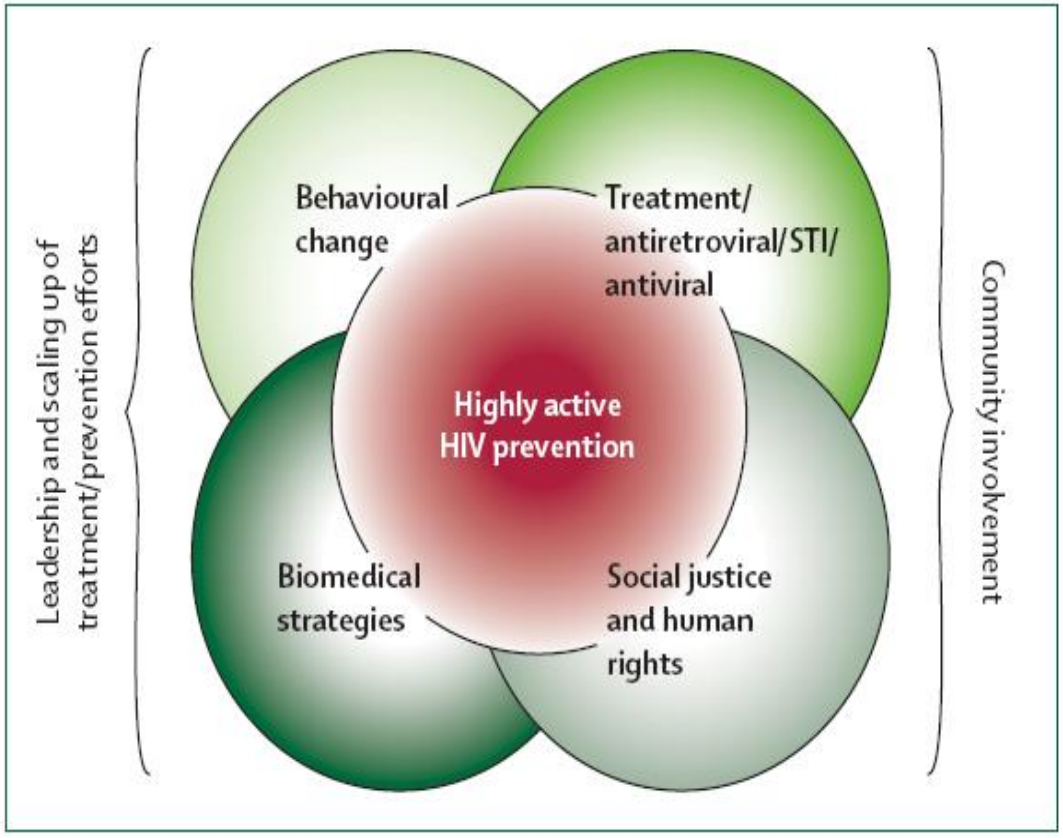

Figure 1: **Highly active HIV prevention**
This term was coined by Prof K Holmes, University of Washington School of Medicine, Seattle, WA, USA.[5] STI=sexually transmitted infections.

Coates, *Lancet*, 2008

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QUESTIONS?

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