Care and Viral Suppression among Persons Newly Diagnosed with HIV

New York City, 2006-2013

Ellen W. Wiewel, Lucia V. Torian*, Qiang Xia, Sarah L. Braunstein

HIV Epidemiology & Field Services Program
New York City Department of Health

http://www.nyc.gov/html/doh/html/dires/hivepi.shtml

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Disclosures

Ellen W. Wiewel, Lucia V. Torian, Qiang Xia, Sarah L. Braunstein

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- Objective: to measure linkage to care and viral suppression in persons newly diagnosed with HIV in New York City, 2006-2013
  - N ~ 3,000/year
- Data Source:
  - HIV surveillance registry (1981→)
    - Comprehensive HIV-related laboratory reporting
    - Cumulative total >230,000 cases
    - >8 million laboratory reports
  - Population: new diagnoses 18 years and older
- Outcome Variables:
  - Linkage to care (CD4 or VL) at 3 months
  - Viral suppression (<400 copies) at 6 and 12 months

NYC in the Literature

- History of using surveillance data to measure care and, more recently, viral suppression
- Present talk updates these papers with longer followup
  - What progress did we make in the years between 2006 and 2013?

ORIGINAL INVESTIGATION

Risk Factors for Delayed Initiation of Medical Care After Diagnosis of Human Immunodeficiency Virus

Lucia V. Torian, PhD; Ellen W. Wiewel, MHS; Kai-Lih Liu, PhD; Judith E. Sackoff, PhD; Thomas R. Frieden, MD, MPH

Background: The full benefit of timely diagnosis of human immunodeficiency virus (HIV) infection is realized only if there is timely initiation of medical care. We used routine surveillance data to measure time to initiation of care in New York City residents diagnosed as having HIV by positive Western blot test in 2003.

Methods: The time between the first positive Western blot test and the first reported viral load and/or CD4 cell count or percentage was used to indicate the interval from initial diagnosis of HIV (non-AIDS) to first HIV-related medical care visit. Using Cox proportional hazards regression, we identified variables associated with delayed initiation of care and calculated their hazard ratios (HRs).

Results: Of 1928 patients, 1228 (63.7%) initiated care [illegible] sis at a community testing site (HR, 1.9; 95% confidence interval [CI], 1.5-2.3), the city correctional system (HR, 1.6; 95% CI, 1.2-2.0), or Department of Health sexually transmitted diseases or tuberculosis clinics (HR, 1.3; 95% CI, 1.1-1.6) vs a site with colocated primary medical care; nonwhite race/ethnicity (HR, 1.8; 95% CI, 1.5-2.0); injection drug use (HR, 1.3; 95% CI, 1.1-1.5); and location of birth outside the United States (HR, 1.1; 95% CI, 1.0-1.2).

Conclusions: A total of 1597 persons (82.8%) diagnosed as having HIV in 2003 ever initiated care, most within 3 months of diagnosis. Initiation of care was most timely when diagnosis occurred at a testing site that offered colocated medical care. Improving referrals by nonmedical sites is critical. However, because most diagnoses occur in medical sites, improving linkage in these sites will have the [illegible]

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Continuity of HIV-Related Medical Care, New York City, 2005–2009: Do Patients Who Initiate Care Stay in Care?

Lucia V. Torian, Ph.D., and Ellen W. Wiewel, M.H.S.

Abstract

In this era of effective antiretroviral therapy, early diagnosis of HIV and timely linkage to and retention in care are vital to survival and quality of life. Federal guidelines recommend regular monitoring of HIV-related laboratory parameters and initiation of antiretroviral treatment at specified thresholds. We used routinely reported laboratory data to measure intervals between visits by New York City residents newly diagnosed with HIV July 1 to September 30, 2005, and initiating care within 3 months of diagnosis. We measured regular care (≥1 visit every 6 months) and retention in care (last visit ≤6 months before close of analysis) through June 30, 2009. Patients were

Achievement and Maintenance of Viral Suppression in Persons Newly Diagnosed With HIV, New York City, 2006–2009: Using Population Surveillance Data to Measure the Treatment Part of "Test and Treat"

Lucia V. Torian, PhD and Qiang Xia, MD, MPH

Background: Viral suppression reduces HIV-related morbidity and transmission to uninfected partners. Models suggest that the transmission benefit may extend to whole communities.

Methods: We used New York City surveillance data to analyze viral suppression among persons newly diagnosed with HIV between 2006 and 2009. The Kaplan–Meier product limit method was used to estimate the cumulative proportion achieving suppression and experiencing failure. Cox proportional hazards regression was used to identify

INTRODUCTION

Recent clinical trials have demonstrated that HIV transmission can be reduced in discordant couples by control of viremia in the infected partner.[1–5] Ecologic analyses suggest that the concept can be extended to whole populations,[6] and mathematical models predict that a "test-and-treat" strategy incorporating universal testing, immediate initiation of antiretroviral therapy (ART), and population-level virologic suppression would ultimately eliminate incidence.[7–10] A "real-world" evalu-

Retention in Care and Viral Suppression Among Persons Living With HIV/AIDS in New York City, 2006–2010

Lucia V. Torian, PhD, Qiang Xia, MD, MPH, and Ellen W. Wiewel, MHS

Objectives. We estimated the proportions of persons living with HIV/AIDS (PLWHA) in New York City (NYC) retained in care and virally suppressed.

Methods. We used routinely reported laboratory surveillance data to measure trends in retention in care and viral suppression in PLWHA in NYC from 2006 through 2010. Our denominator excluded persons lacking any HIV-related laboratory tests during the 5 years prior to the year of analysis.

Results. The proportion of patients retained in care (≥ 1 care visit in a calendar year) was stable, at 82.5% in 2006 and 81.8% in 2010. However, the proportion of persons with evidence of viral suppression increased significantly, from 44.3% to 59.1%. Blacks were least likely to have viral suppression (adjusted prevalence ratio [APR] = 0.89; 95% confidence interval [CI] = 0.87, 0.90). A U-shaped relationship between age and viral suppression was observed, with the 20- to 29-year age group least likely to have a suppressed viral load.

Suppression of viremia in HIV-infected persons is associated with improvements in morbidity and mortality and reduced transmission to uninfected partners.[1–6] The US Department of Health and Human Services Panel on Antiretroviral Guidelines for Adults and Adolescents recommends that all patients with HIV undergo regular monitoring of disease status and be treated with antiretroviral therapy (ART).[7] However, despite the wide availability of HIV care services in the United States, many HIV-infected persons are not engaged in regular [illegible] ART.[8–11]

Monitoring Outcomes for Newly Diagnosed and Prevalent HIV Cases Using a Care Continuum Created With New York City Surveillance Data

Ellen W. Wiewel, MHS, Sarah L. Braunstein, PhD, Qiang Xia, MD, Colin W. Shepard, MD, and Lucia V. Torian, PhD

Background: The HIV care continuum has been used to show the proportion of persons living with HIV/AIDS (PWHA) who are engaged in each stage of HIV care. We present 1 care continuum for persons newly diagnosed with HIV and 1 for PWHA using New York City HIV surveillance registry data.

Methods: Persons newly diagnosed with HIV in 2011 or PWHA as of December 31, 2011, were included. We constructed each continuum for persons engaged at each stage of HIV care and calculated the proportion achieving each step as both dependent on diagnosed persons. To improve outcomes among persons with HIV and reduce transmissibility, clinical and public health efforts should focus on linkage to care among newly diagnosed persons and viral suppression among PWHA.

Key Words: HIV, epidemiology, epidemiologic surveillance, continuity of patient care

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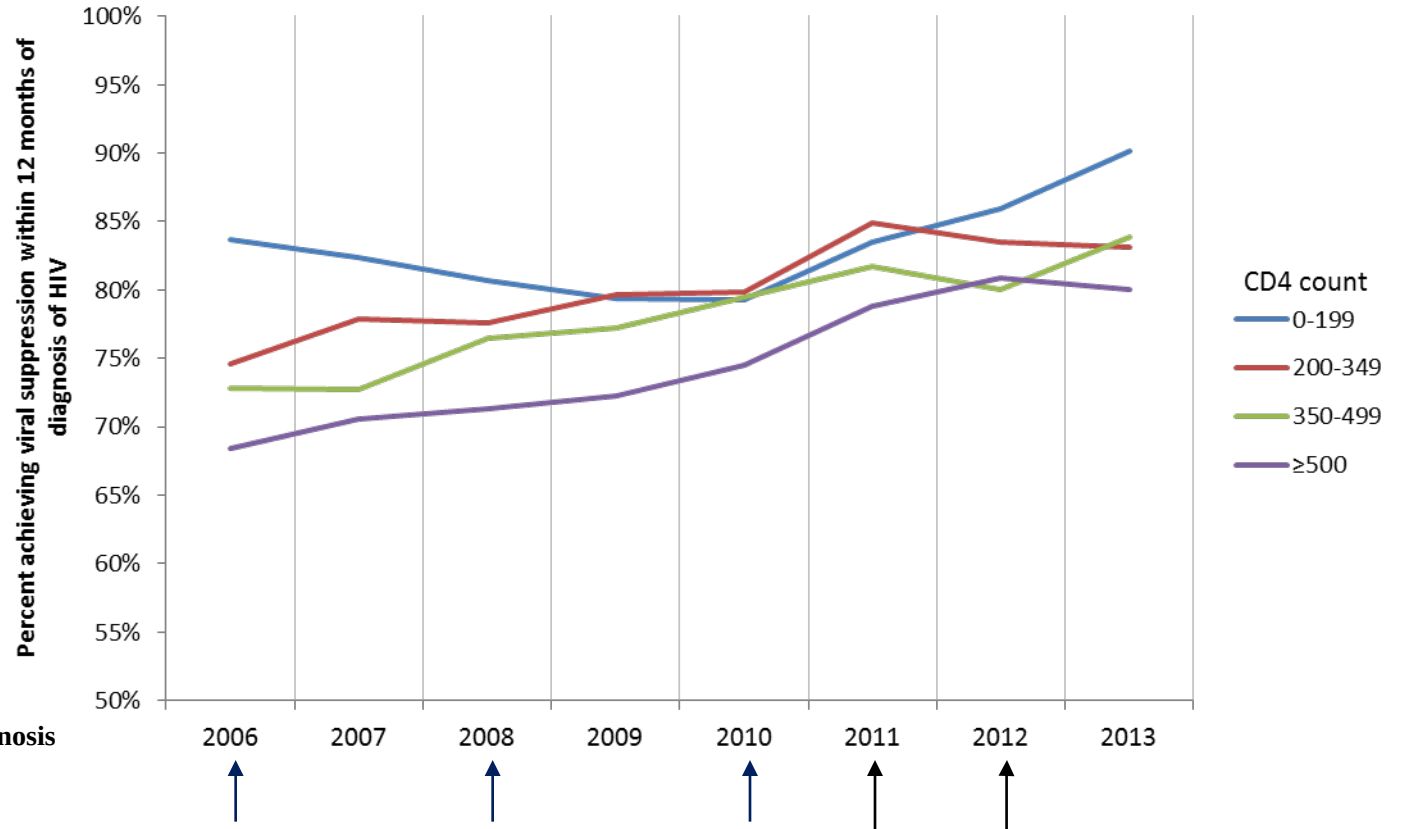
Synopsis of Results

- Timely LTC increased from 68% to 76% (p<0.0001) between 2006 and 2013
- Viral suppression at 6 months increased from 24% to 54%; VS at 12 months increased from 36% to 69% (p<0.0001)
- Main drivers of LTC and VS are CD4 at diagnosis and age
  - Outcomes improved for all groups
  - Disparities by CD4 and age diminished over time

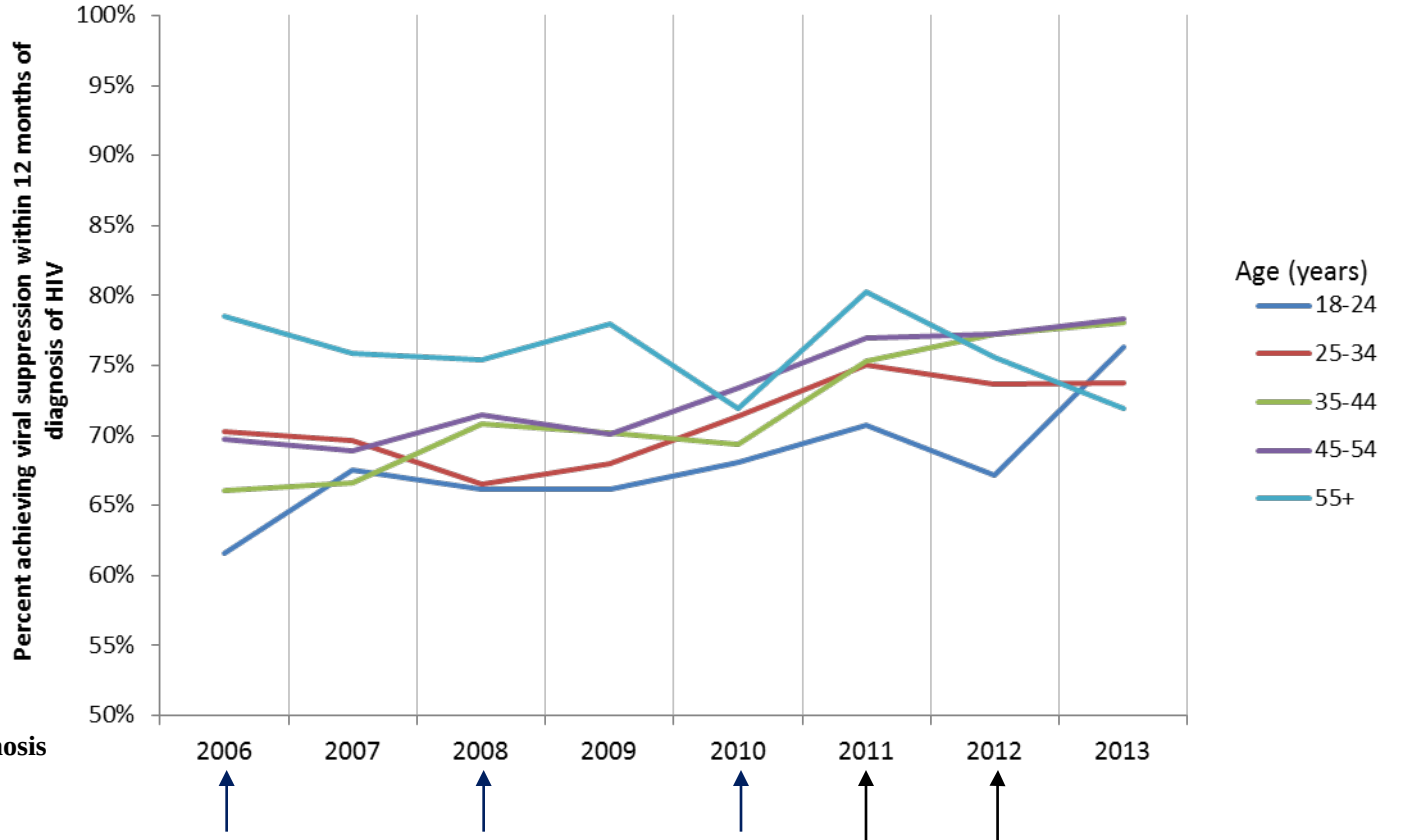
Linkage to Care, 2006-2013

Previous work has shown that LTC is worse in young people and people with high CD4 (>500)

Linkage to Care within 3 Months of Diagnosis of HIV, by CD4 at Diagnosis, New York City 2006-2013



Linkage to Care within 3 Months of Diagnosis of HIV, by Age at Diagnosis, New York City 2006-2013



Linkage to care milestones

CDC testing guidelines; recommend LTC "as soon as possible" after diagnosis

NYC establishes 3 month LTC standard

NYS law: 3 months;

NHAS: 3 months

NYC prevention contracts: premium payment for 3 month linkage; NYS AIDS Institute: 30 day LTC; NYC ART for all

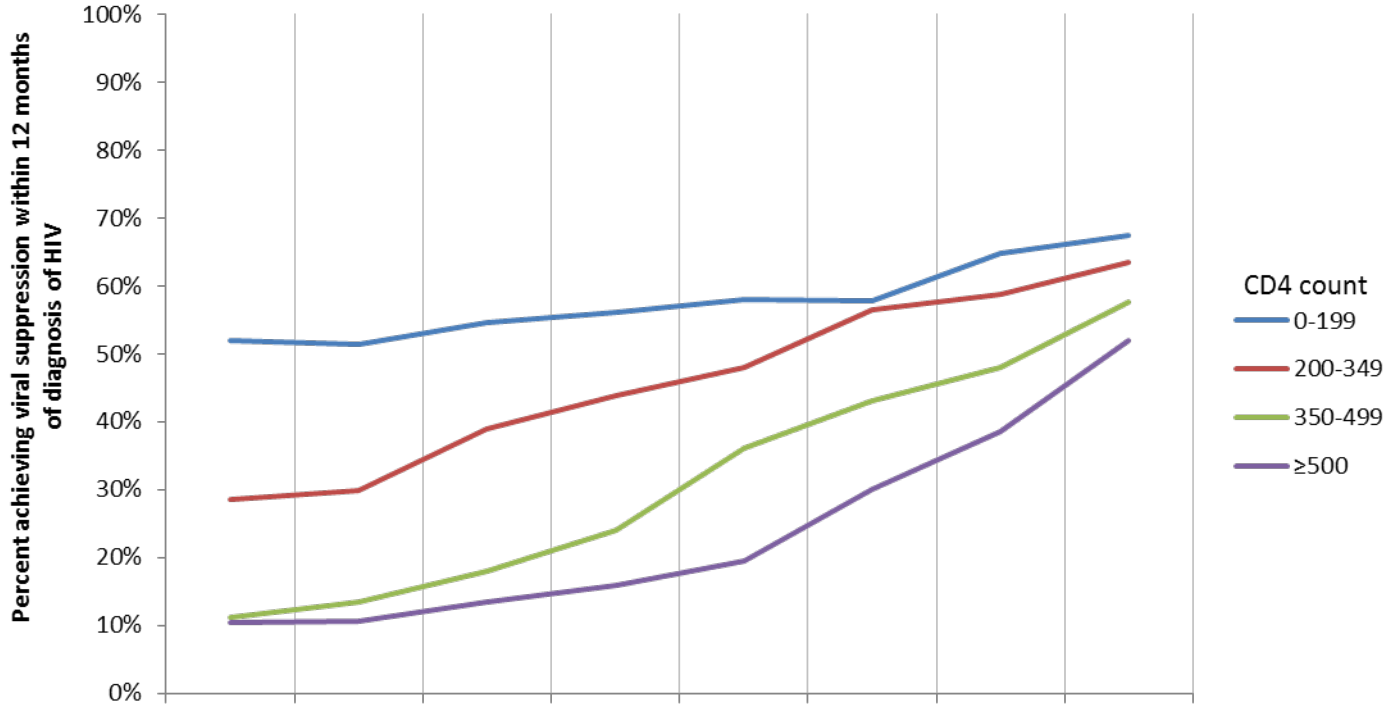
DHHS: ART for all

Viral Suppression at 6 and 12 Months After Diagnosis Trends by CD4 Interval and Age

Previous work has also implicated youth and high CD4 as being associated with less unfavorable outcomes on viral suppression after diagnosis.

Youth and high CD4 (“young and healthy”) often coincide, but each is an independent predictor of VS.

Viral Suppression within 6 Months of Diagnosis of HIV, by CD4 at Diagnosis, New York City 2006-2013



	2006	2007	2009	2011	2012
DHHS ART Guidelines	Clinical AIDS, or CD4 <200	Pregnant, Nephropathy, NBV *offer* 200-350	<350; *Recommend* 350-500: Panel split on >500	<500; Panel split on >500	All HIV+
Sentinel Drug Approvals	Atripla	RAL		Complera	Stribild
Sentinel Publications			Attia *AIDS*; Granich *Lancet*	Donnell *Lancet*	Cohen *NEJM*

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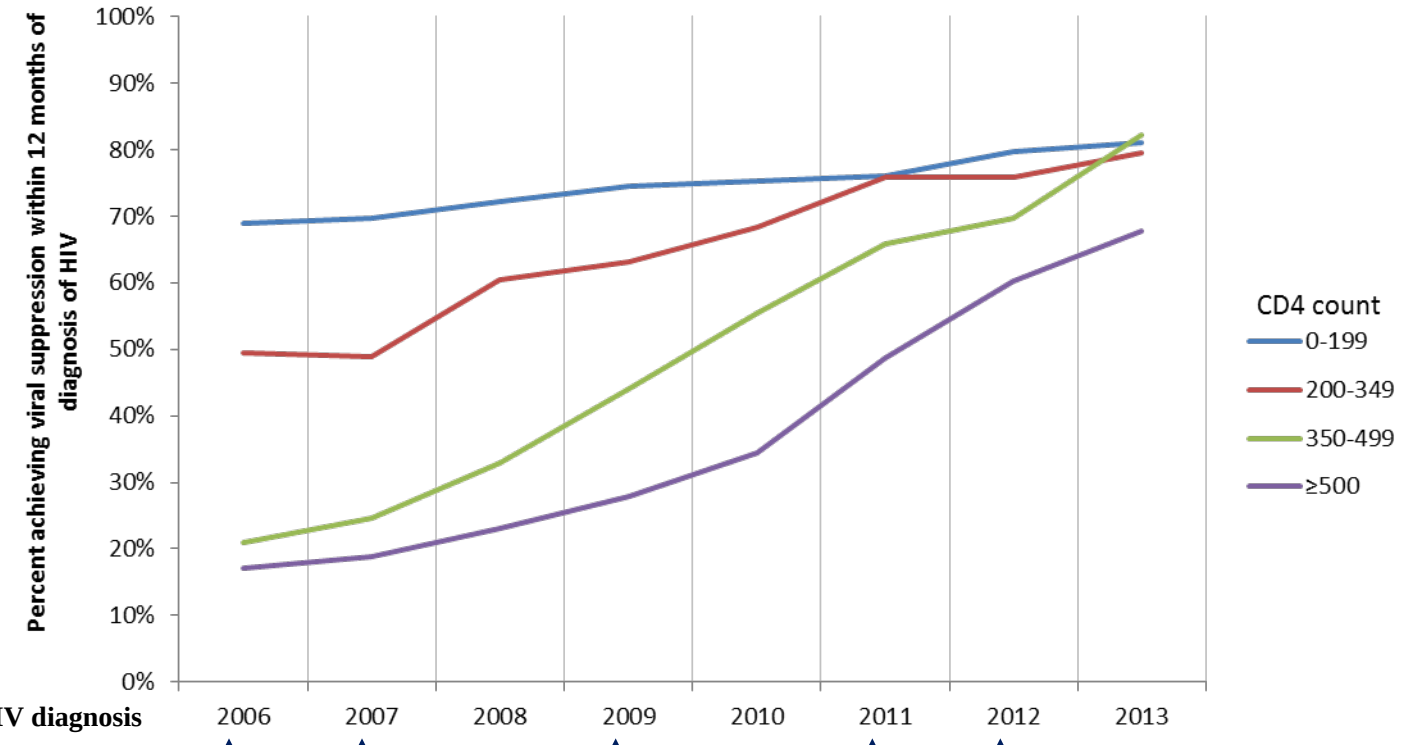
Viral Suppression within 12 Months of Diagnosis of HIV, by CD4 at Diagnosis, New York City 2006-2013



	2006	2007	2008	2009	2010	2011	2012	2013
Year of HIV diagnosis								
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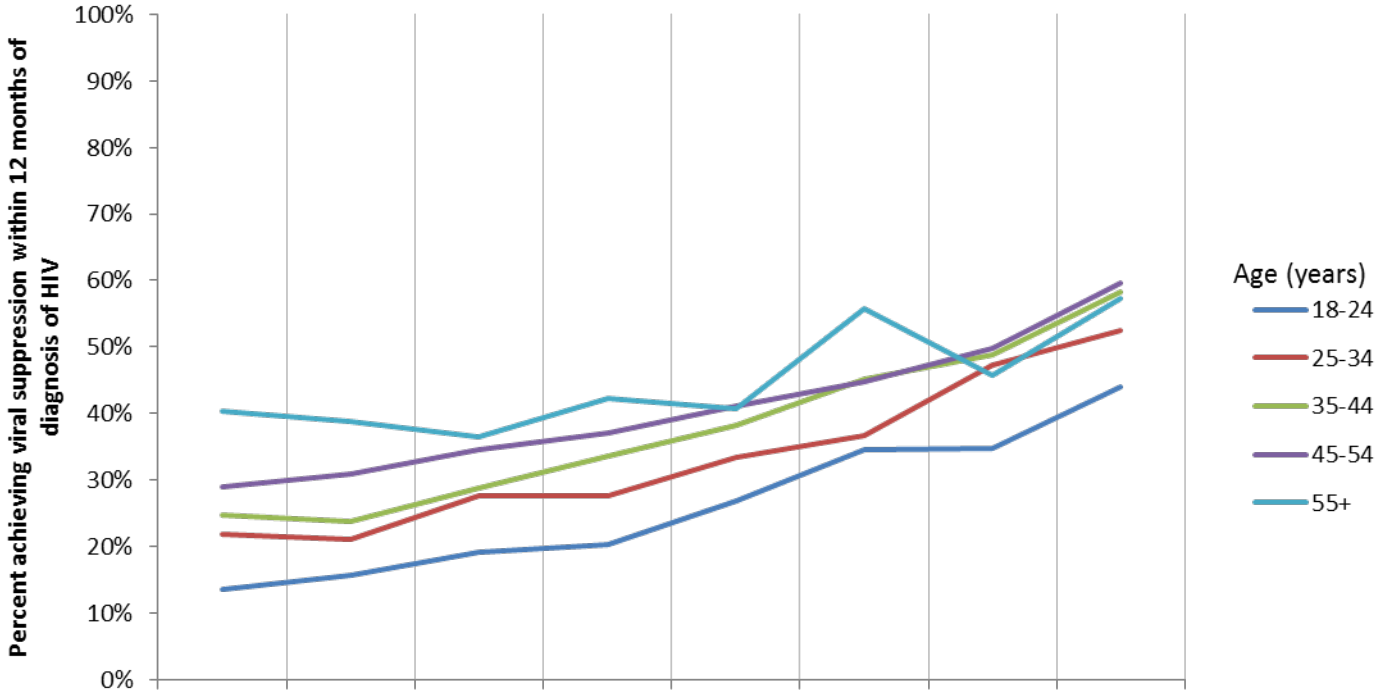
NYC Health

Viral Suppression within 6 Months of Diagnosis of HIV, by Age at Diagnosis, New York City 2006-2013



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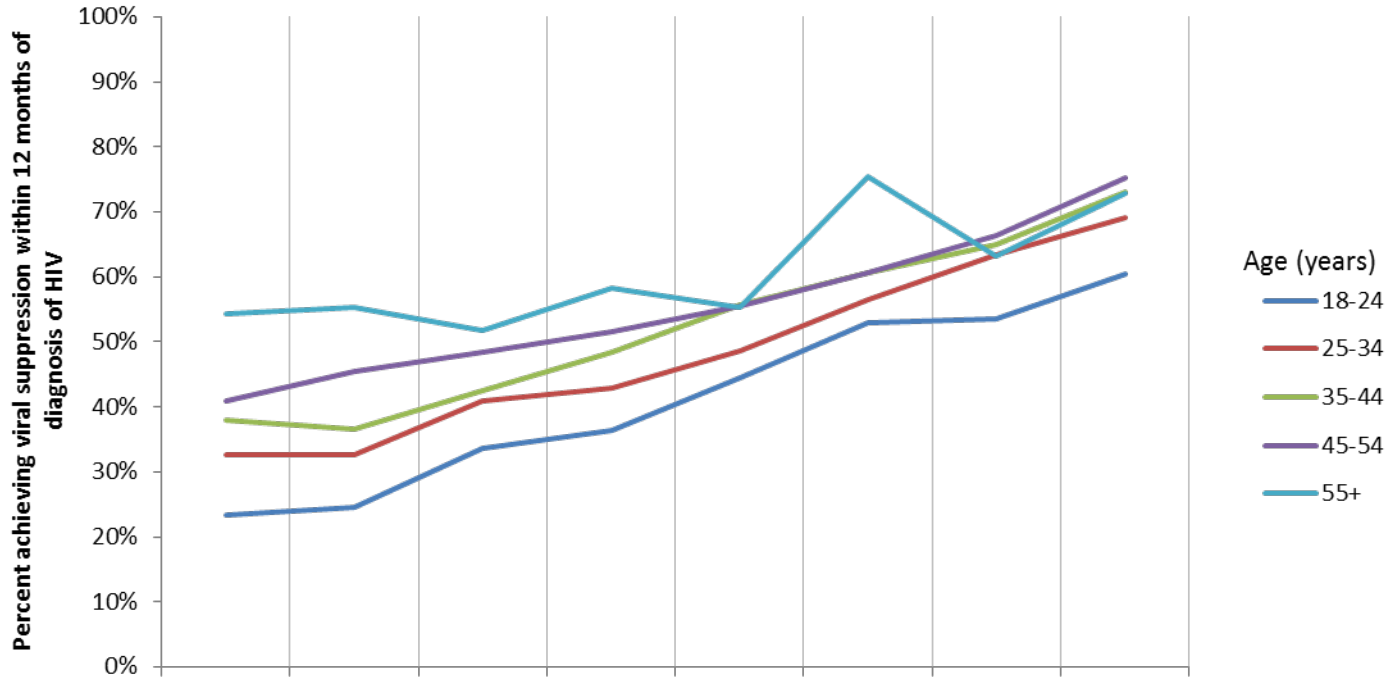
Viral Suppression within 12 Months of Diagnosis of HIV, by Age at Diagnosis, New York City 2006-2013



DHHS ART Guidelines

- 2006: Clinical AIDS, or CD4 <200
- 2007: Pregnant, HIVAN, HBV; *offer* 200-350
- 2009: <350; *Recommend* 350-500: Panel split on >500
- 2011: <500; Panel split on >500
- 2012: All HIV+

Sentinel Drug Approvals

- 2006: Atripla
- 2007: RAL
- 2011: Complera
- 2012: Stribid

Sentinel Publications

- 2009: Attia *AIDS*; Granich *Lancet*
- 2010: Donnell *Lancet*
- 2011: Cohen *NEJM*

What is the historical context in which we should interpret these trends?

- The legends and data show that improved linkage and suppression were coterminous with changes in state, local and federal guidelines
- Increases in linkage were steepest in 2010-11, the year of and the year after implementation of NYS law requiring testing and LTC
- Increases in suppression escalated as federal guidelines raised the CD4 threshold and, finally, eliminated it.

Strengths and Limitations

- Strengths of our analysis:
  - Population-level data – all dx'd in NYC
  - Large dataset representing large, old epidemic with mixed/localized epidemic dynamics
  - Universal HIV-related laboratory reporting
  - Long period of follow-up
- Limitations:
  - Undx'd missing from this analysis (~14%)
  - No data on ART use
  - Accurate matching of labs to cases
  - No care markers if no labs drawn at visit
  - No out of jurisdiction F/U → "missed" visit

Next Steps

- Where do we go from here?
  - NYS requires proactive linkage to care after dx (2010)
  - NYC recommends immediate initiation of ART after dx (2011)
  - DHHS recommends same (2012)
- Adoption of change
  - Change agents/opinion leaders
    - Institutional policy, momentum
    - Community mobilization and buy-in
  - Patient demand (PPI, MAb, ACT UP), incentives
  - Scale up and target support for adherence
    - Identify who has trouble staying in care and on ART

Treatment as Prevention

- Granich modeled 30 yrs to zero with a perfect scenario – 100%-100%-100%
- The real world right now:
  - 70% VS among new diagnoses
  - 70% VS among PLWHA ***Can we get to 80%?*** ⟵
  - 14% undiagnosed ***Can we get to 5%?*** ⟵
    - Virtually all undiagnosed will be viremic
    - ? % are acute HIV = efficient transmitters
- Can we do better?
  - Suppression
  - Early diagnosis

The Imperfect Scenario

- Can New York achieve 90%-90%-90% as in Australia and San Francisco?
- One model of success: pregnant women
  - This took science, law, and buy-in by doctors, mothers and their families
  - Exceeds 90%-90%-90% now
- Is this achievable in adults? Probably not – but what might be?
- If Granich can get to zero in 30 years, how long might it take to get there with achievable numbers?

The Whole Prevention Package

- Today's focus: care and viral suppression in new positives
- PLWHA – many of whom are long-term survivors – are another challenge
- Whole public health package includes getting PrEP and other effective prevention interventions to the people that need them
  - Help the seronegatives stay negative
  - Prevent secondary transmission

Thank you

- To my co-authors and our colleagues in surveillance who do the shoe leather epi and data management that produce our datasets
- To our NYS colleagues who manage the laboratory reporting system
- To the laboratories and providers who faithfully report their test results and diagnoses to the surveillance system