



The Evolving HIV Epidemic In American Adolescents: New Challenges And New Tools

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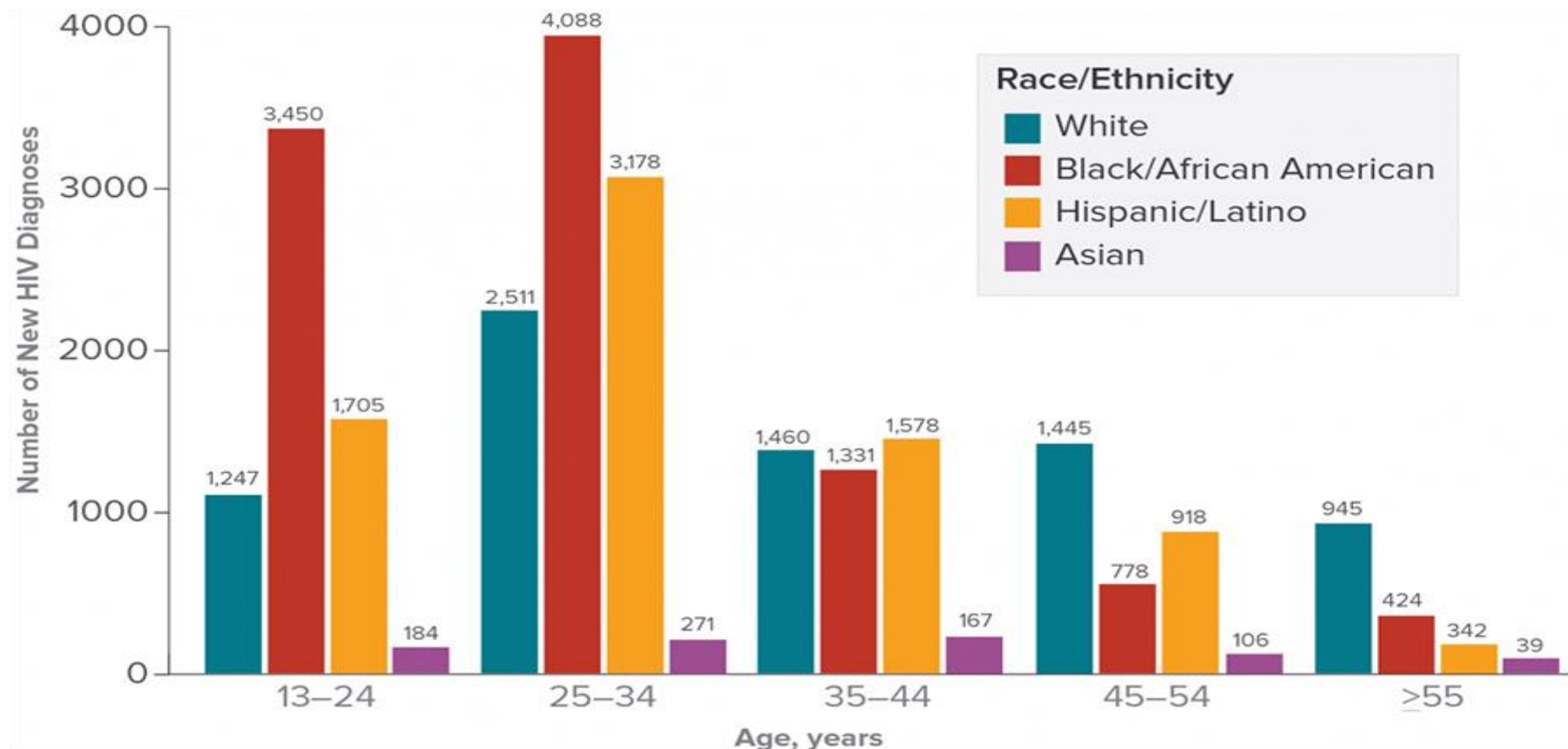
Kenneth H. Mayer, MD

HOPE Conference

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thefenwayinstitute.org

New HIV Diagnoses Among US Gay and Bisexual Men By Age and Race/Ethnicity, 2017



Multi-Level Drivers of HIV Risk in American MSM

Biology	<ul style="list-style-type: none">• Enhanced efficiency of anal intercourse• STI inflammation and ulceration• Role versatility (being able to be receptive and insertive)
Individual behavior	<ul style="list-style-type: none">• Depression, and other affective disorders• Substance use• Avoidant health-related behavior delaying engagement in care• Condomless Sex
Social Networks	<ul style="list-style-type: none">• Number of partners/time• Assortative mixing in high prevalence subgroups• Sexualized venues (e.g. bath houses, apps)
Structural/Institutional	<ul style="list-style-type: none">• Societal discrimination: racism, xenophobia• Health system discrimination• Punitive laws and criminalization• Poverty• Violence/victimization

Reasons for the Disproportionate Burden of HIV and STIs in Young Men Who Have Sex With Men (YMSM)

SYSTEMS

- Poverty
- Inability to access youth friendly services
- Insensitive health care professionals
- Lack of community support (e.g. unaffirming faith communities)

MENTAL HEALTH/HEALTH

- Low health literacy
- Internalization of stigma
- Depression due to internalized stigma
- Childhood trauma- physical or sexual abuse
- Substance use
- Neurodevelopmental - immature brain

RELATIONSHIPS

- Limited autonomy-living with families
- Coming out leading to homelessness, domestic violence
- Predatory adults providing material or emotional support
- Limited role models, limited peer support
- Peer norms not supporting self-protective behavior
- Social/segregation resulting in most partners from high prevalence networks
- Low self-efficacy
- Developing self-concept leading to experimentation



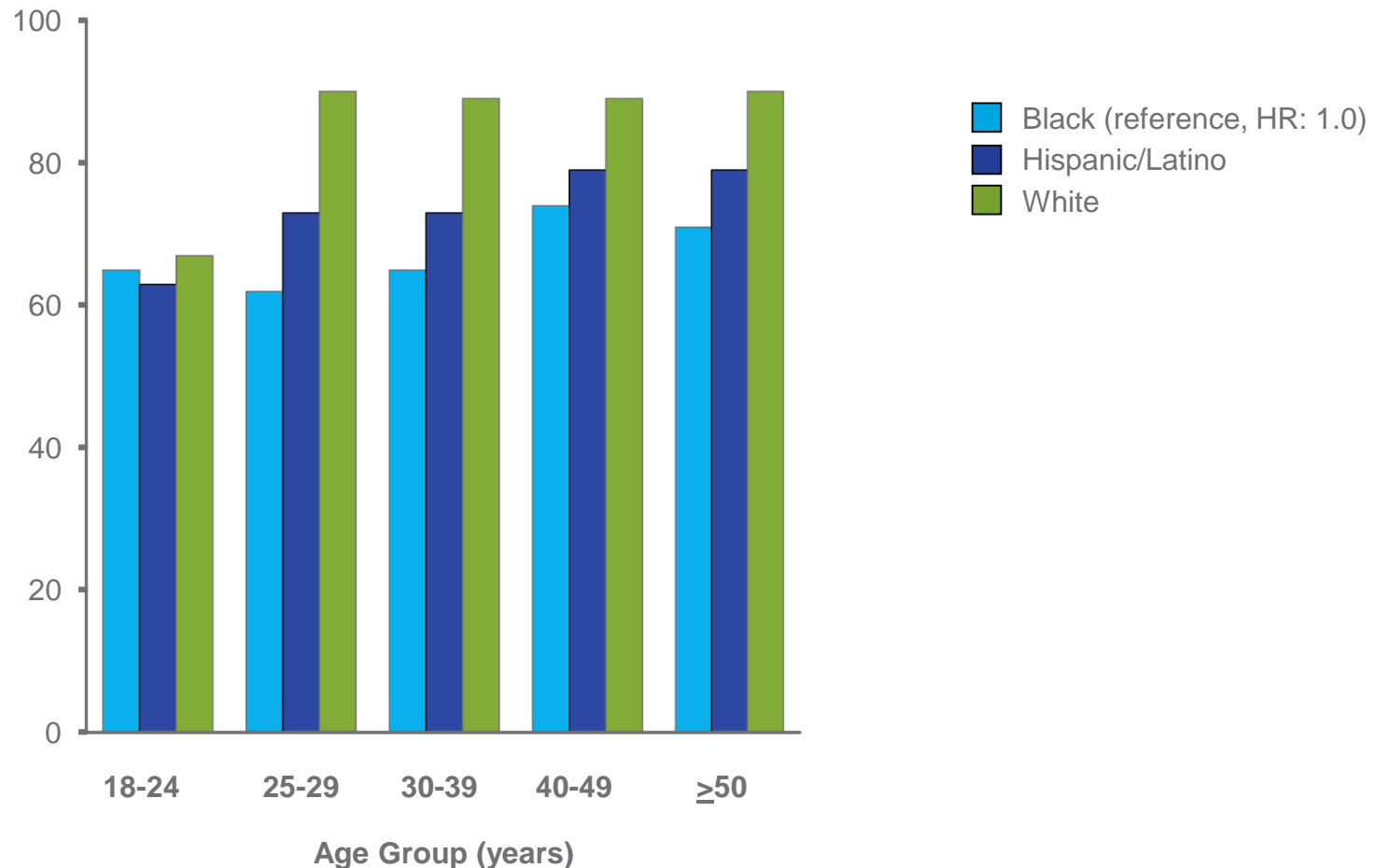
Life course perspective: Growing up and coming out



- Same sex behavior and gender non-conformity remains stigmatized in most societies
- Societal messages remind LGBT Youth they are not accepted (marriage pressure, exclusion from military)
- LGBT Youth may encounter loss of friends, lack of family support, religious abandonment, and verbal or physical abuse, resulting in adverse health outcomes
- External stigma may → internalized homophobia → depression, substance use
- **Sexual expression is happening earlier**

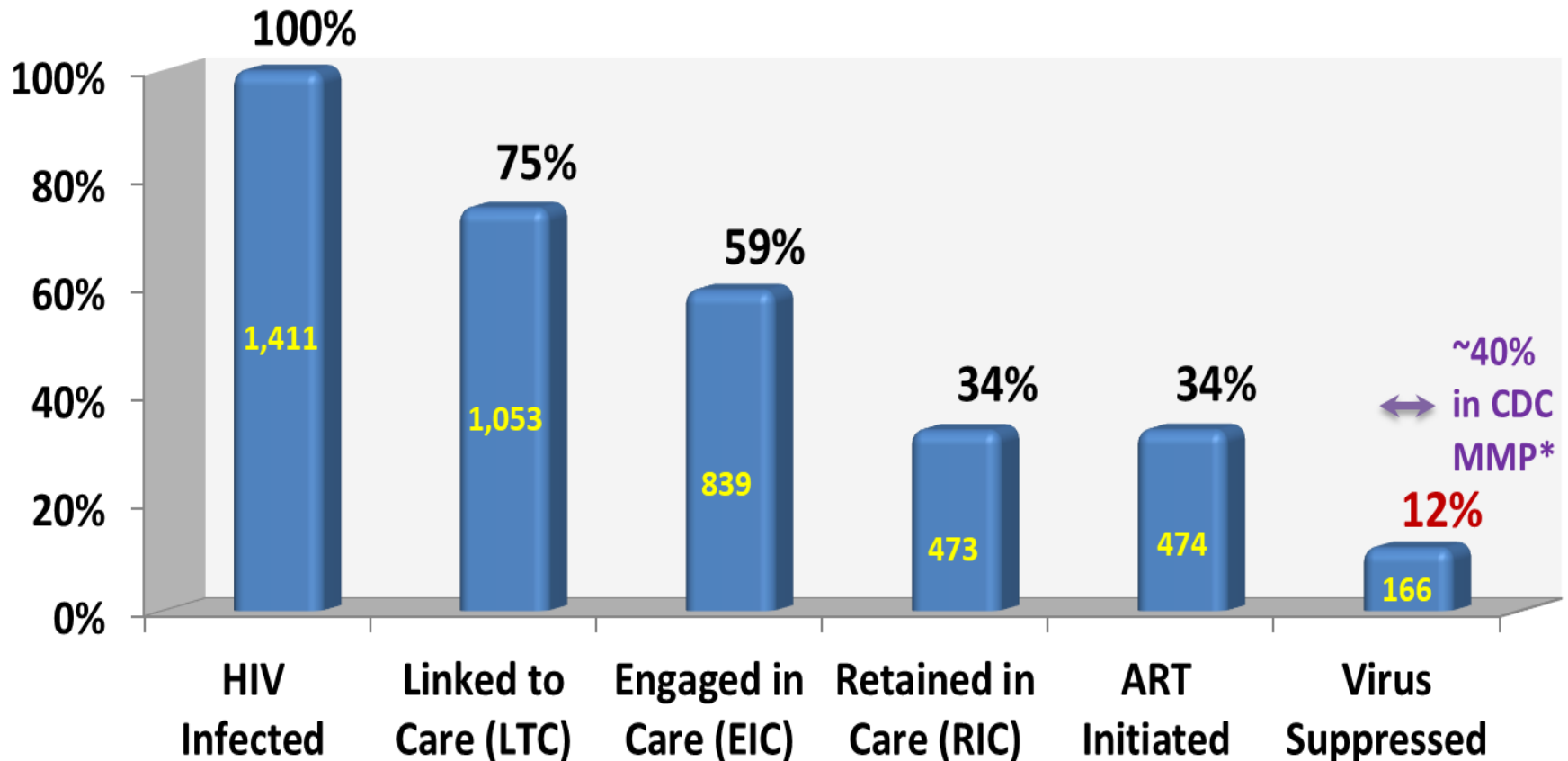
(Harrison, J Sch Health, 2003; Drasin, J Homosex, 2008; D'Augelli, Clin Child Psych, 2002; Grov, J Sex Res, 2006)

HIV Status Awareness Is Lower In YMSM Than Other Age Groups



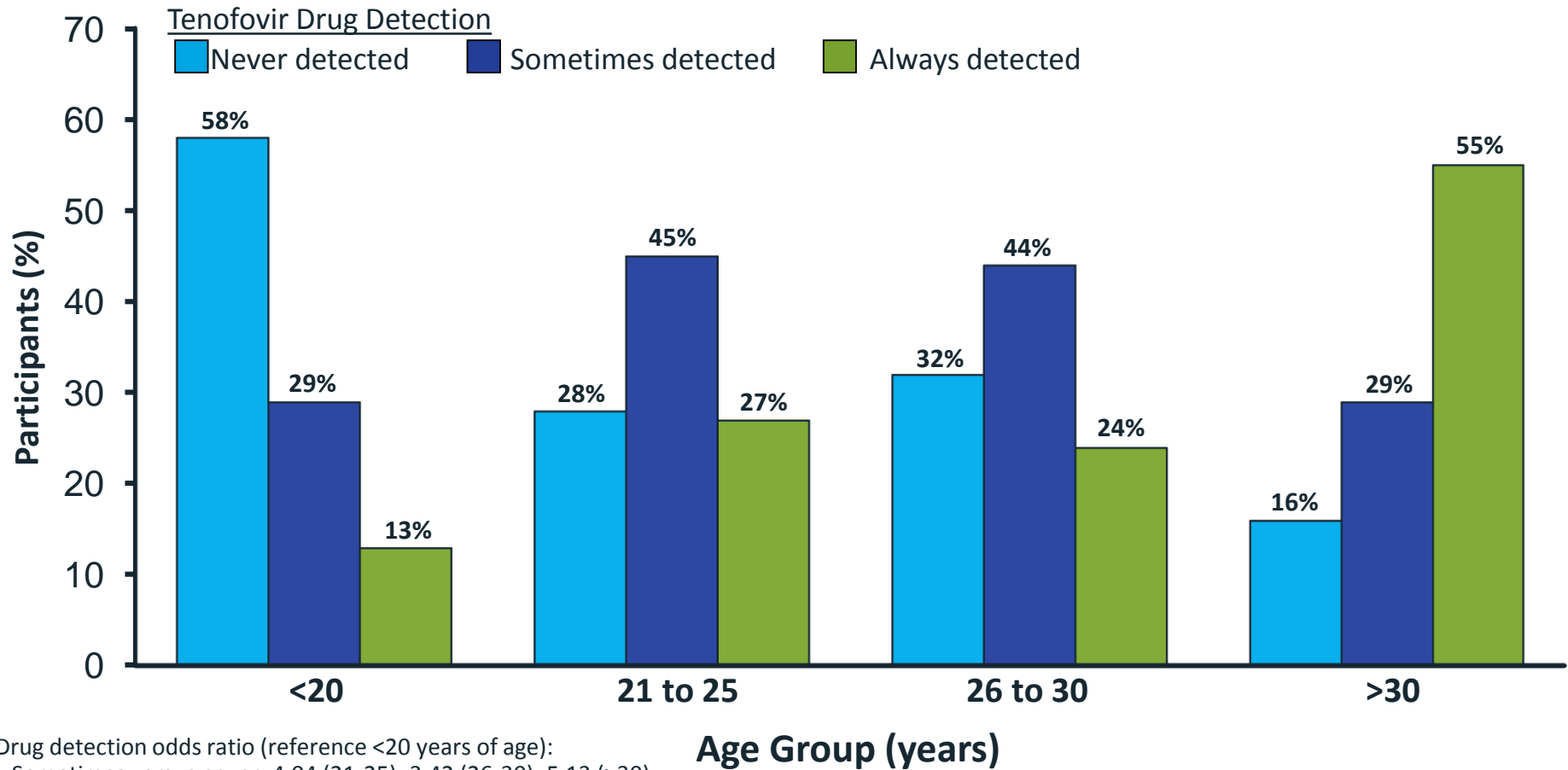
n=8735 MSM interviewed as part of the CDC's National HIV Behavioral Surveillance.

HIV Continuum of Care for Youth Attending 13 Urban Centers in the US



*CDC Supplemental Surveillance Report for 2013, Published July 2015

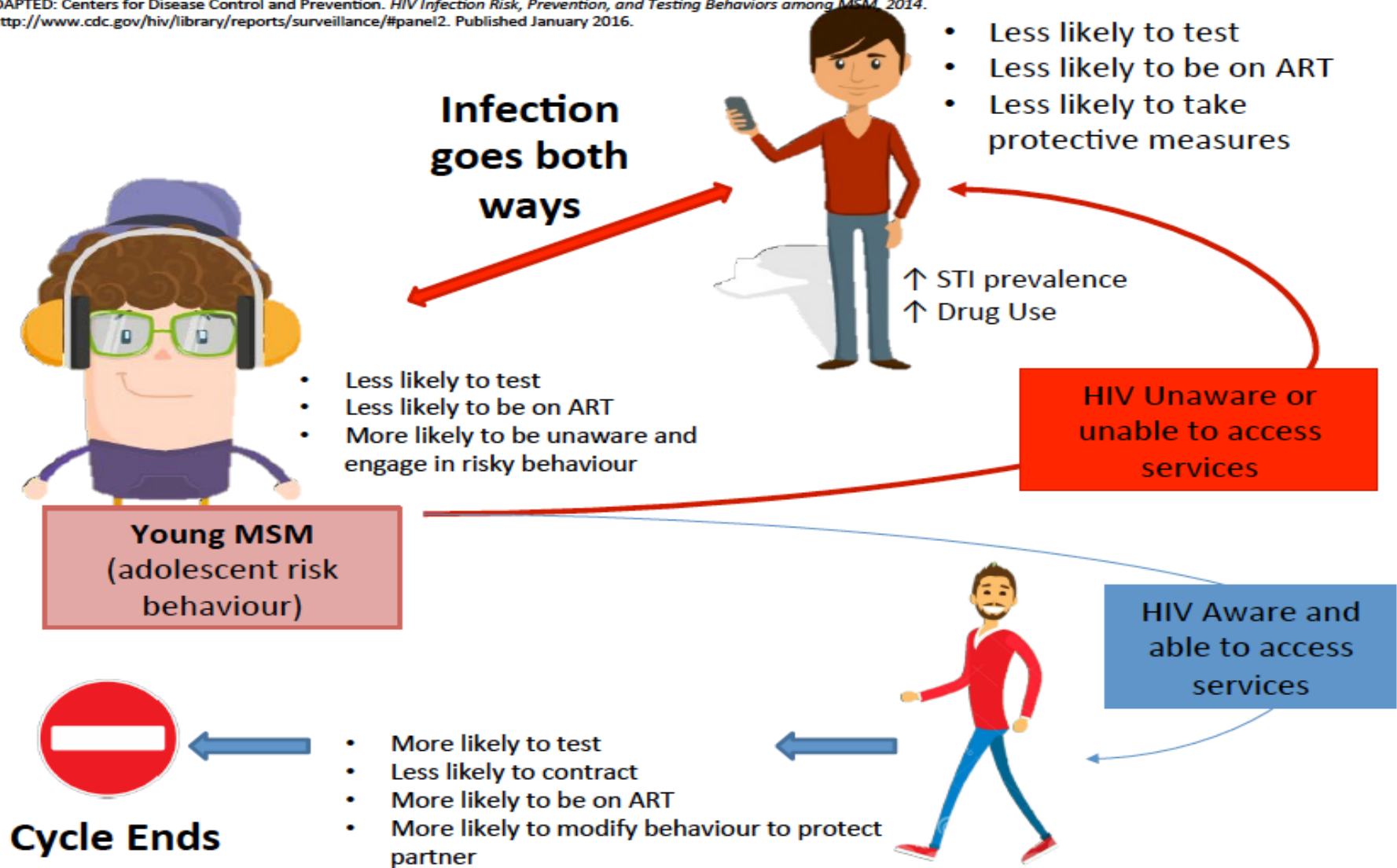
iPrEx Study: Age and Adherence



Liu A, et al. *JAIDS*. 2014;67:528-537.

Vicious Cycle of Infection for YMSM

ADAPTED: Centers for Disease Control and Prevention. *HIV Infection Risk, Prevention, and Testing Behaviors among MSM*. 2014.
http://www.cdc.gov/hiv/library/reports/surveillance/#panel2. Published January 2016.





- The primary mission of the ATN is to conduct both independent and collaborative research that explores promising behavioral, microbicidal, prophylactic, therapeutic, and vaccine modalities in HIV-infected and at-risk adolescents, ages 12 years through 24 years.
- ATN is the only domestic, multicenter research network devoted to the health and well-being of HIV-infected and at-risk adolescents and young adults.



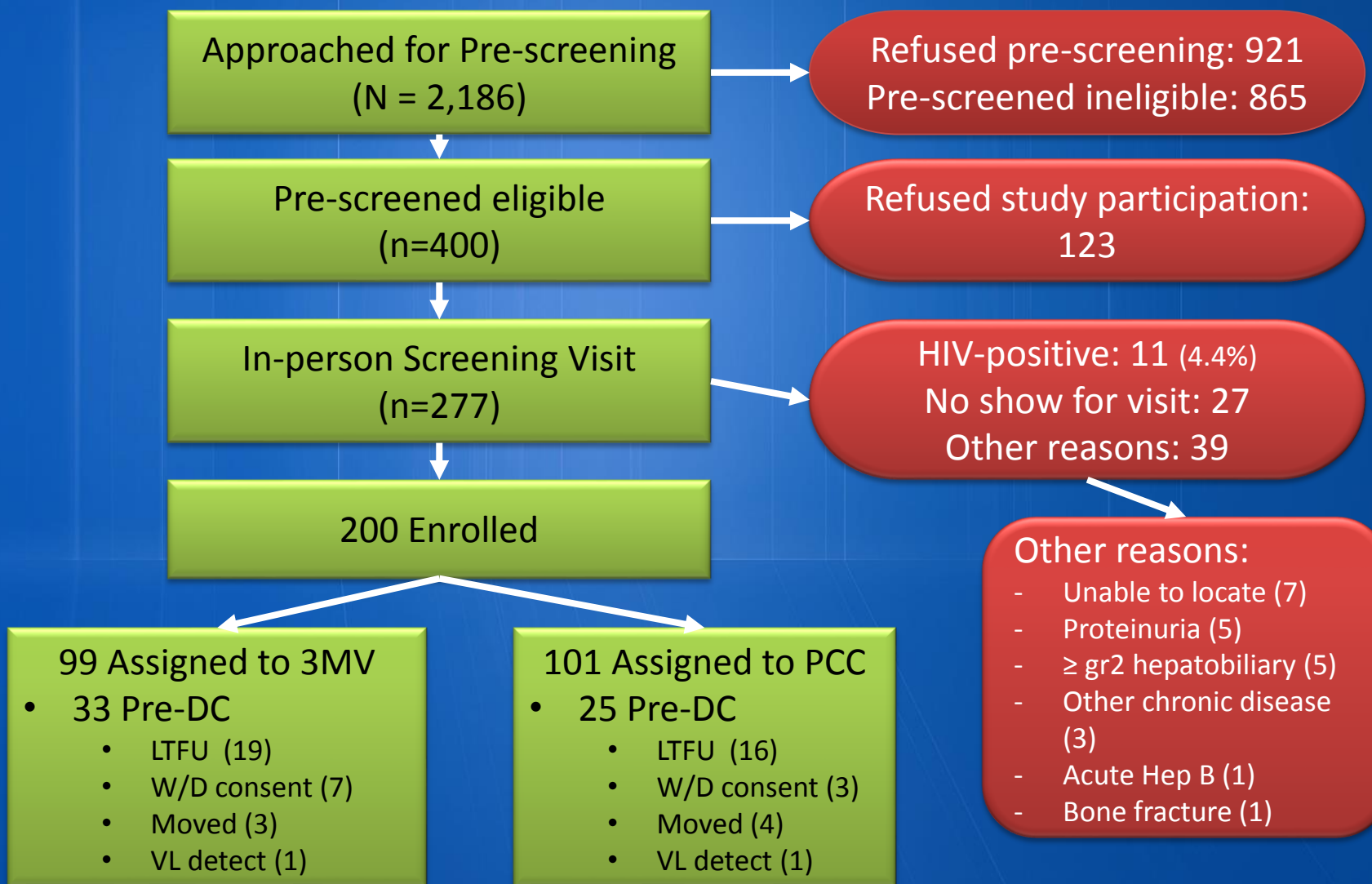
ATN 110 Study Sites



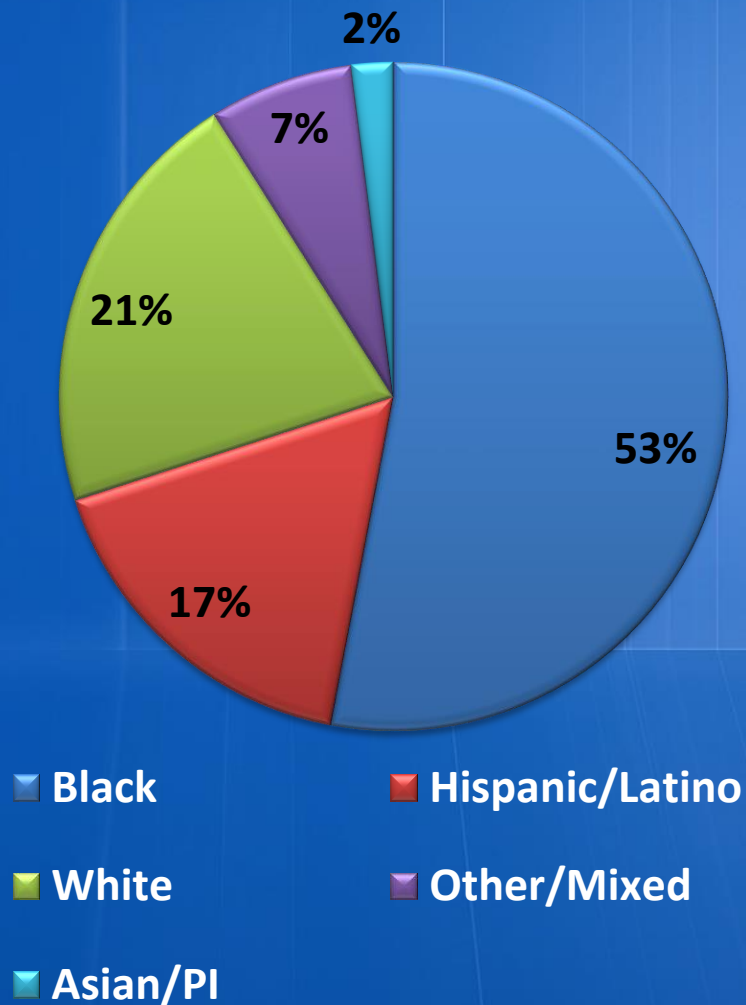
Primary Objectives for ATN 110/113

- Paired PrEP studies:
 - ATN 110 (ages 18-22)
 - ATN 113 (ages 15-17)
- To provide safety data regarding FTC/TDF PrEP for HIV-uninfected YMSM.
- To examine acceptability, patterns of use, adherence and measured levels of drug exposure when YMSM are provided open label FTC/TDF, and information from prior studies.
- To examine patterns of sexual behavior when YMSM are provided an individual or group behavioral intervention in conjunction with PrEP.

Consort Diagram



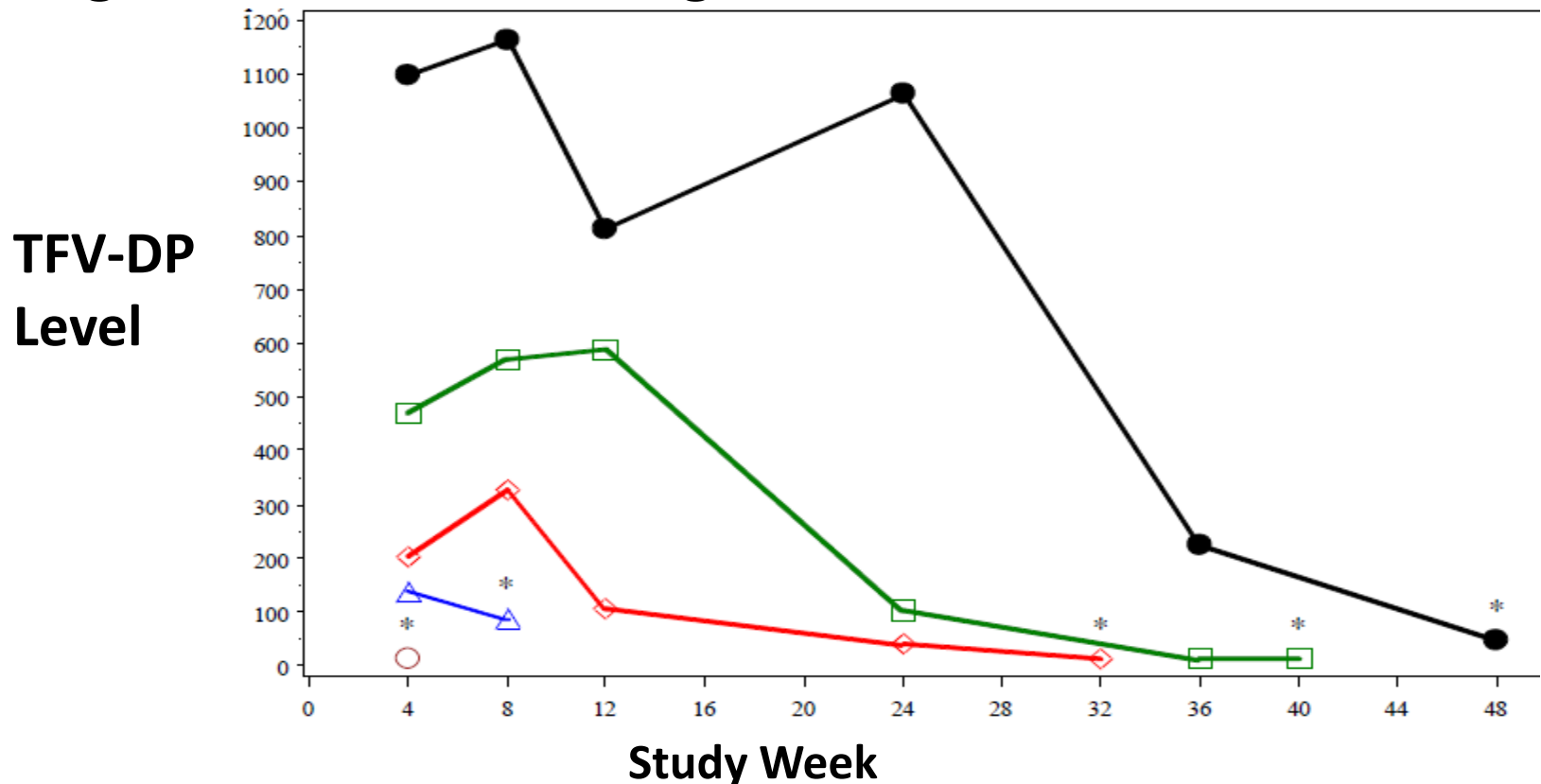
Baseline Demographics



Mean age	20.18
Sexual Identity	Gay – 77.8% Bisexual – 13.7%
Highest grade completed	High School – 33.8% Some college – 45.5%
Not currently working	30.1%
Ever kicked out	17.2%
Ever paid for sex	28.6%
Partners in past mo	5
Condomless sex	81%
CRAI w/last partner	58%
Any positive STI test	22%

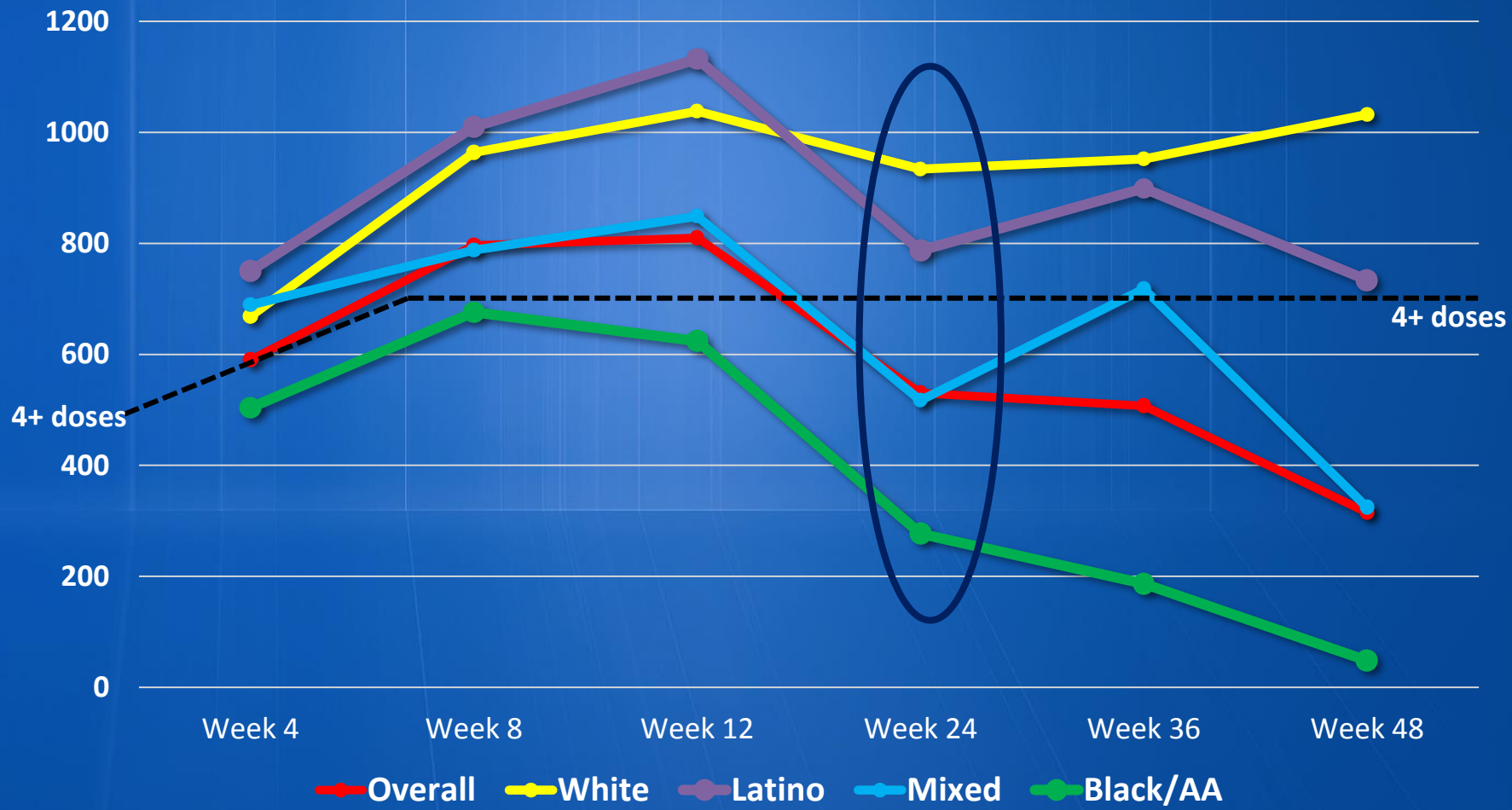
HIV Incidence and Ongoing risk

- 4 seroconversions through week 48
- HIV incidence = 3.3% in ATN 110; 6% in ATN 113
- No drug resistance found
- High levels of STI throughout the studies



Adherence:

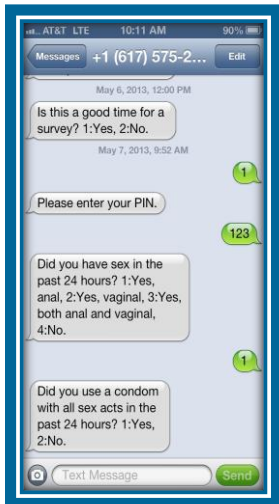
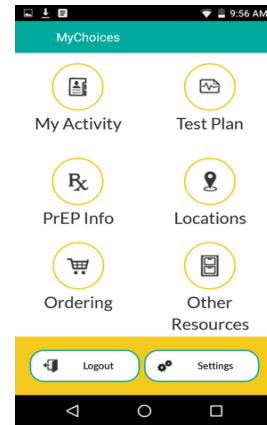
Median TFV-DP by Race/Ethnicity



Digital Media and Young MSM



- Social and digital media are present in all aspects of young MSM lives, from dating and sexual apps, to accessing sexual health information.
- Social media offer powerful tools to reach, engage, and retain youth in HIV prevention and care, and to deliver personalized, theory-based interventions and health education.
- Technology-based platforms are being evaluated as a way to deliver services in an engaging and culturally-congruent way for YMSM.
- Machine learning and natural language processing algorithms could be further utilized to better understand online behaviors that foster risk, and content that can promote medication adherence and preventative behavior



Muessig, Curr HIV/AIDS Rep, 2014; Holloway, AIDS Behav, 2014; Hightow-Weidman, STI, 2017;

FOSTERING PERSISTENT ENGAGEMENT OVER TIME

The law of attrition

- In many mHealth intervention trials, a substantial proportion of users drop out (*dropout attrition*) before completion or stop using the app/website (*nonusage attrition*).

Key Considerations:

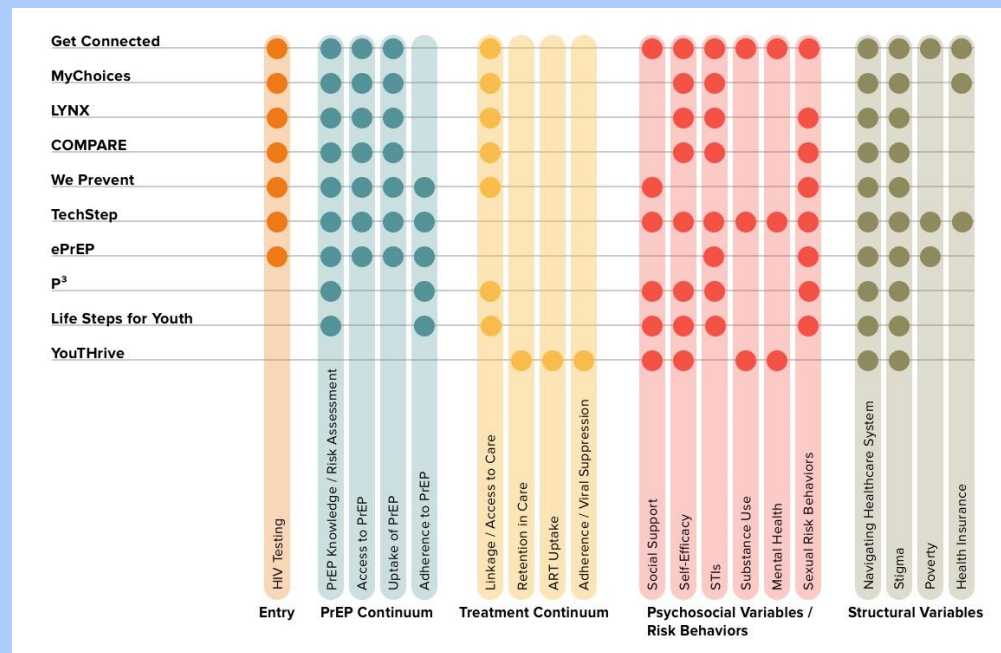
- ✓ Tailoring interventions to users
- ✓ Fostering social (peer) support
- ✓ Inclusion of game-based elements
- ✓ Provision of self-monitoring/feedback
- ✓ Inclusion of “push factors” (reminders, notifications)

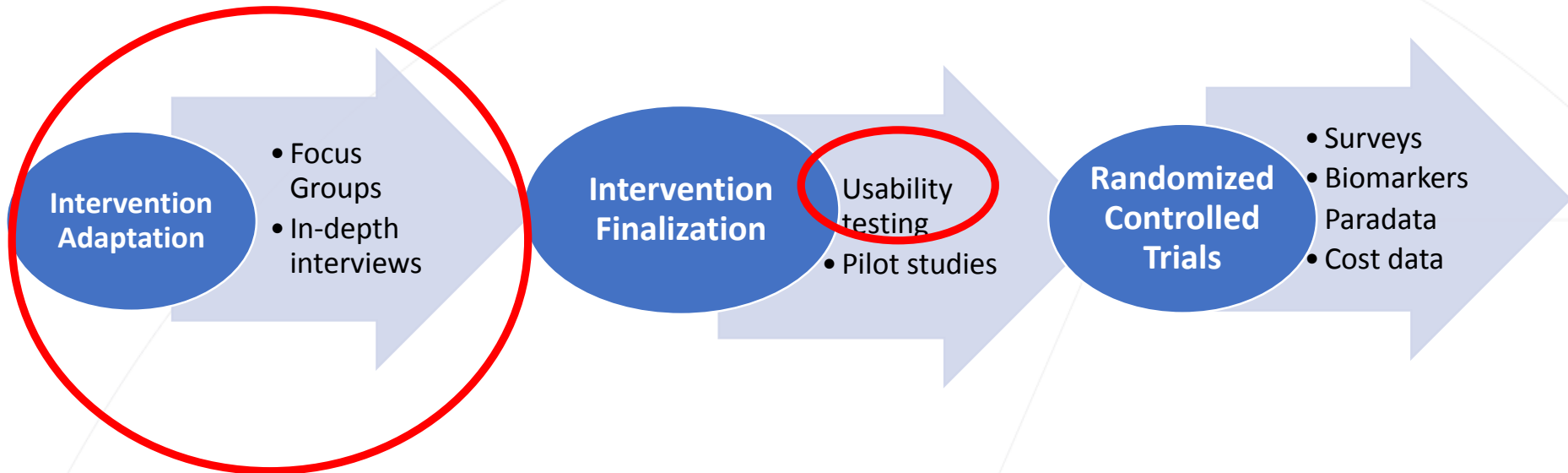
Eysenbach. J Med Internet Res 2005;7(1):e11



ITECH CONTINUUM OF CARE

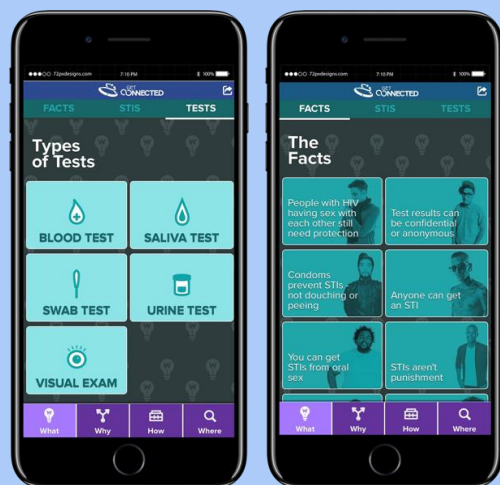
- Studies address the breadth of the prevention continuum, including **structural** and **psychosocial variables**
- Majority of studies engaging YMSM and trans youth.
- One study for HIV+ youth
- Total number of planned participants in iTech: **>3000**





- **iTech Cores support the design, implementation and analysis of all study phases**
- **Formative phases involve adapting, tailoring, and usability testing refined intervention technologies**

HIV TESTING AND PREP AWARENESS



Mystery Shopping to inform app completed in Philadelphia, Atlanta, and Houston

A motivationally-based, brief online intervention that employs individual and systems-level tailoring technology to reduce barriers to linkage into competent HIV/STI prevention for YMSM.

Site Tailored On:

- Age
- Race/Ethnicity
- Sexual Identity
- HIV Testing
- STI Testing
- Structural Struggles
- Sources of Support
- Values

Jose Bauermeister, PhD; Rob Stephenson, PhD, MSc





A novel mobile app to support linkage to HIV/STI testing and PrEP for YMSM

Adaptation of *Sex Pro*, a mobile app based on the Information, Motivation, Behavioral Skills) model to increase accurate risk perception and protective behaviors.



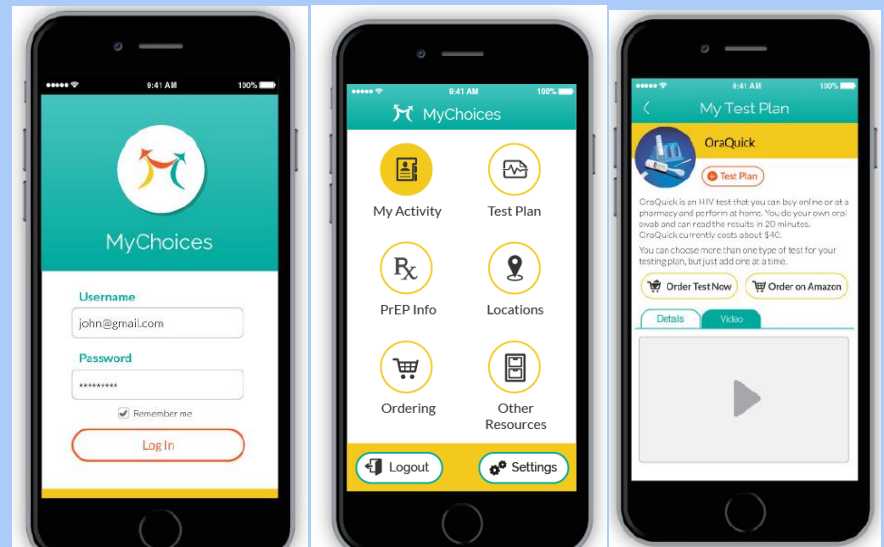
Albert Liu, MD, Hyman Scott, MD





“MyChoices” to Increase Uptake of HIV Testing, Detection of New HIV Infections, and Linkage to Care and Prevention Services by Young Men Who Have Sex With Men

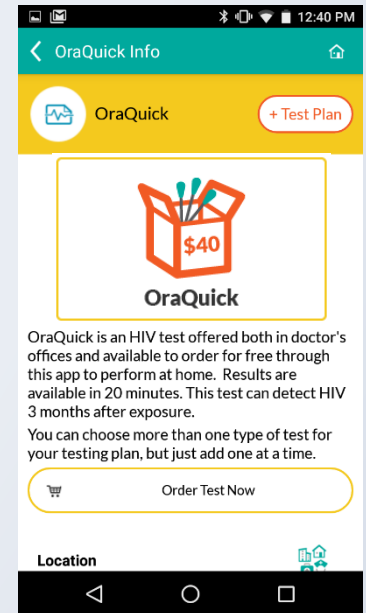
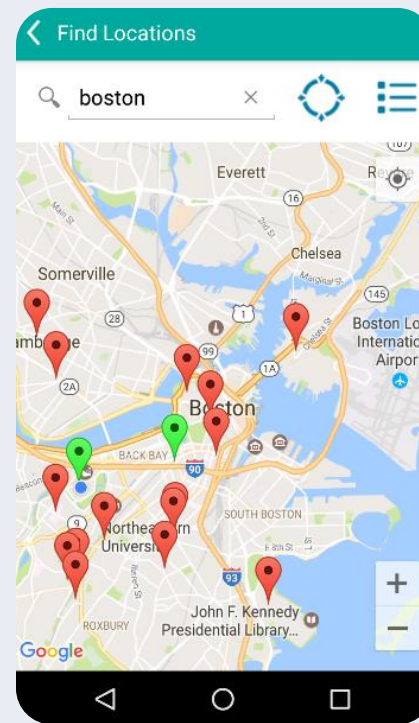
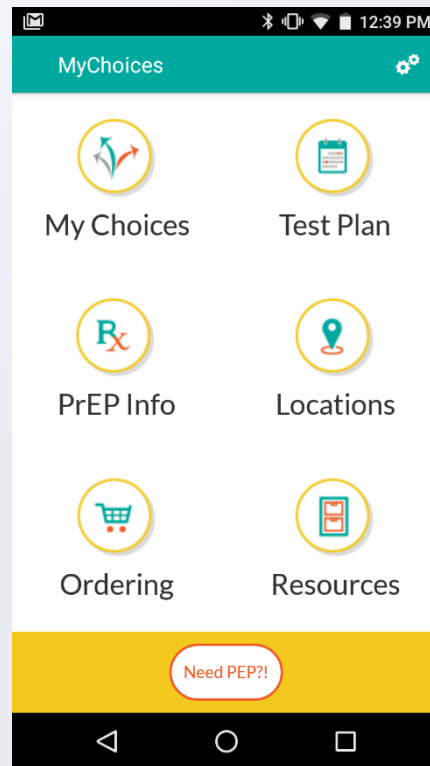
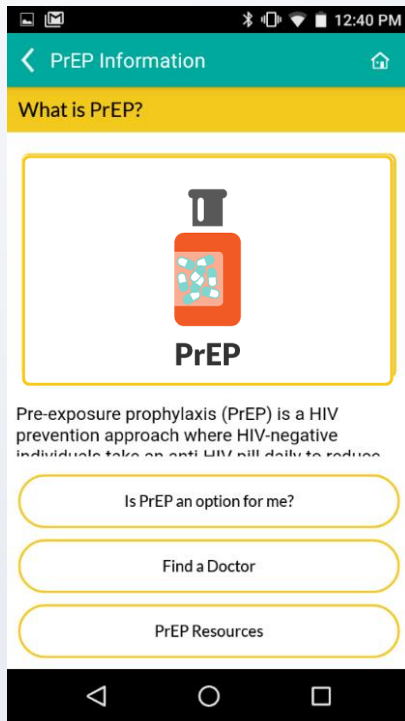
Adaptation of *HealthMindr* app, guided by Social Cognitive Theory aiming to promote self-efficacy, self-regulation, goal-setting and environmental influences to impact behavior change.



Katie Biello, PhD, MPH; Kenneth Mayer, MD



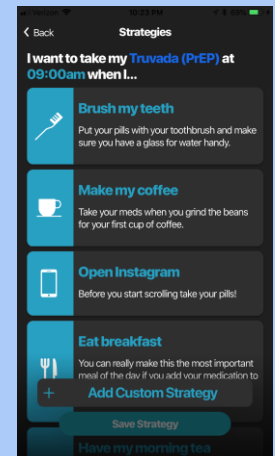
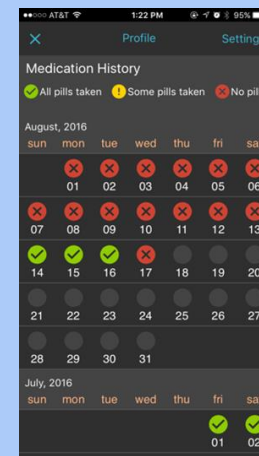
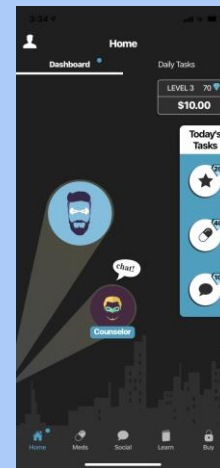
MyChoices





Iteration of the *CHARGE* app platform – based in social cognitive theory, narrative communication, and persuasive technology – utilizing social networking and game-based components to encourage PrEP adherence

A social gamification app to improve PrEP adherence and networking



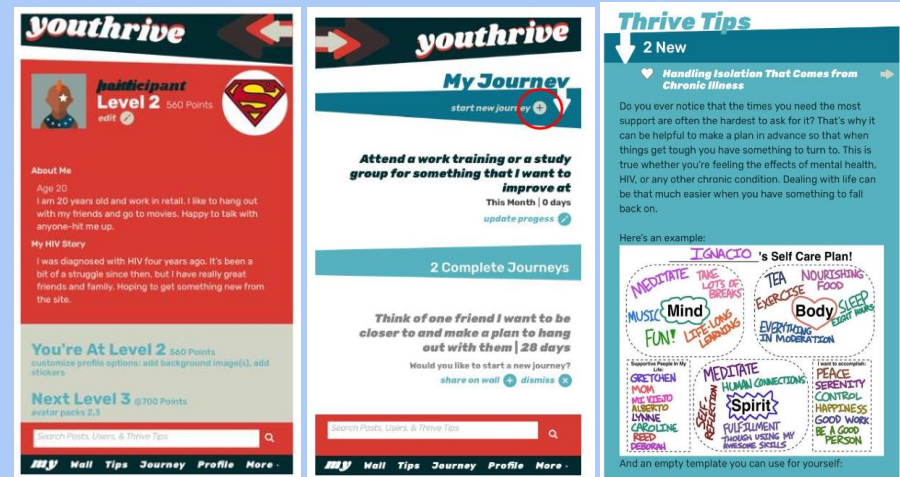
Lisa Hightow-Weidman, MD, MPH; Sara LeGrand, PhD





Connecting Youth and Young Adults to Optimize ART Adherence

Adaptation of *Thrive With Me* app which uses enhanced peer-to-peer interaction, medication reminders and self-monitoring, and ART and HIV informational content to improve adherence



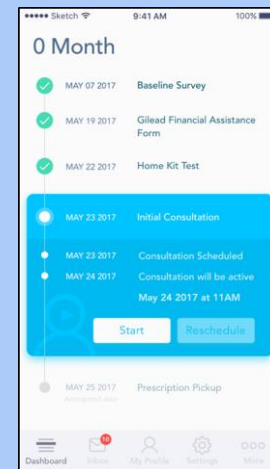
Keith Horvath, PhD; Rivet Amico, PhD





ePrEP: Testing an Electronic PrEP Initiation and Maintenance Home Care System to Promote PrEP Among Adolescent MSM in Rural and Small Town Areas

- **Full telemedicine PrEP:**
- Mobile app for YMSM
- Telemedicine consultations
- Home specimen collection for all recommended labs



Aaron Siegler, PhD; Leandro Mena, MD





TechStep: Technology-Based Stepped Care to Stem Transgender Adolescent Risk Transmission

- Stepped care intervention for HIV-negative Transgender & Gender Non-conforming Youth 15-24 years of age
- Technologies: text messaging, web app, e-Coaching



Cathy Reback, PhD; Keith J. Horvath, PhD



- **We Prevent: a relationships skills intervention to improve HIV prevention uptake among young gay, bisexual and other men who have sex with men and their primary partners.**

Couples-focused HIV prevention delivered through video counseling for young gay, bisexual and other men who have sex with men (YGBMSM) ages 15-21
Intervention: two 45-60 minute sessions delivered via video-chat (VSEE)



Rob Stephenson, PhD, MSc, MA; Kristi Gamarel, PhD, EdM





LifeSteps for PrEP for Youth (LSPY)

Kenneth Mayer, MD; Christina Psaros, PhD

- Life-Steps for PrEP is a manualized modular adherence intervention based on principles of cognitive-behavioral therapy (CBT), that allows for recipients of the intervention to focus on the greatest challenges that they perceive in maintaining optimal adherence to PrEP.
- Text messages to support in-person content



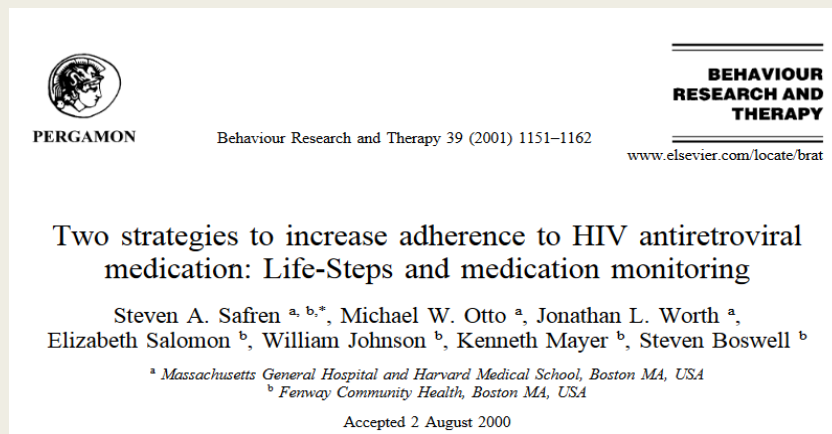
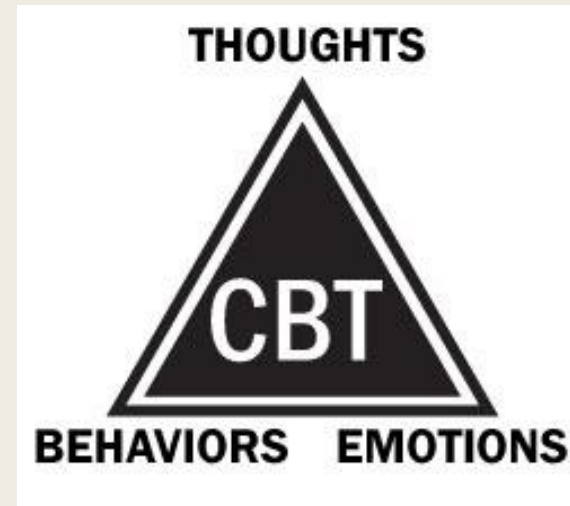
Life-Steps is based on Cognitive-Behavioral Therapy

1. Cognitive: What people think and believe
2. Behavioral: What people do
3. Emotions: What people feel

In CBT the counselor teaches skills to help participants to:

- think about their problems differently
- try different strategies than they have been to solve their problems
- be their own therapist (short term, focused on a specific problem)

CBT is ½ taking a course, and ½ being in “therapy”





Cross-cutting themes

Youth priorities for tech-based HIV prevention and care interventions across iTech studies

1. Privacy
2. Diverse representation
3. Intervention engagement
4. Intervention content



1. Protect our privacy

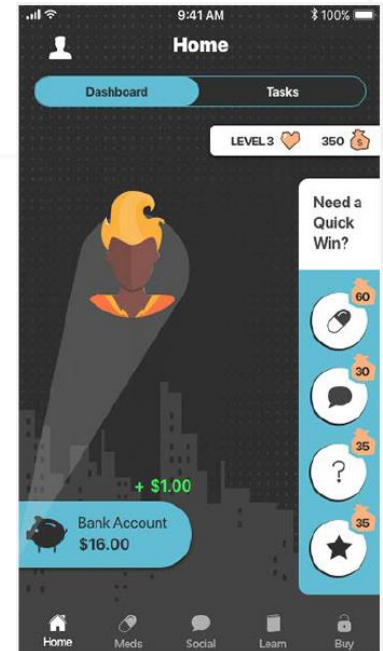
Stigma was consistently discussed and related to keeping HIV status, sexual orientation, and sexual behavior confidential. Youth suggested multiple privacy protections on intervention technologies (e.g. passwords, timeouts, fingerprint ID).





2. Reflect and respect our diversity and identity

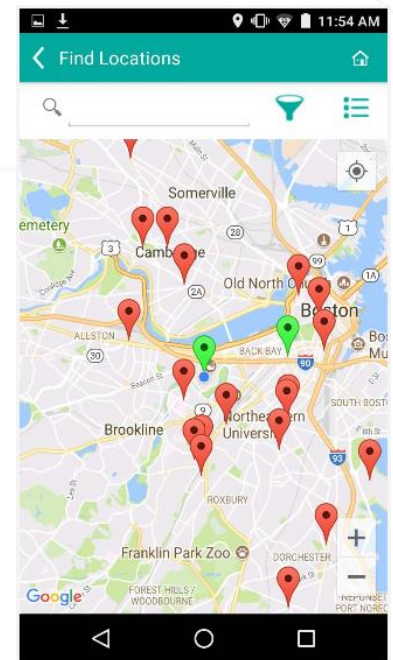
Participants valued highly customizable platforms and positive themes, motivational language, and humor. Imagery should be discrete but representative of individuals and communities.





3. Provide a range of ways for us to engage

Be consistent with familiar platforms (e.g. Snapchat, Instagram, Facebook). Provide customizable messaging functions through frequency, mode, and content. Offer options to contact study staff or clinicians through the platform for resources and support. Present information using multiple modes (text, video, image, activities). Gamification is good, tangible rewards are attractive.





4. We also want space to...

Share our stories, access mental health resources, focus on our health more broadly, learn about healthy relationships (not just HIV-, risk-, or PrEP-centric), and read about other young role models like us, e.g. LGBTQ and minority representation, profiles of successful college graduates, those living with HIV and those on PrEP.





Conclusions

- Technology-based HIV interventions are highly acceptable, promise for reducing gaps in the continuum.
- Focus on user-driven, multi-feature platforms that allow youth to pick and choose features in real-time.
- Uniformity in youth evaluations of these HIV prevention and care tools; divergence in personal preferences (not features/functions).
- To balance preferences with finite resources, couple practical market research approaches (e.g. What would make you use/not use this product?) with app usage data linked to intervention outcomes.

Other HIV prevention approaches for YMSM

- Injectable PrEP (Cabotegravir): HPTN 083-1
 - On demand PrEP: under discussion
 - Enhanced peer navigation: under study
 - Economic incentives: under discussion
-
- One size will not fit all, but given the magnitude of the HIV epidemic among American youth, all creative strategies need to be explored.



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