



# Using Technology for HIV Prevention among Youth

A Summary of Research Findings from  
the Center for Innovative Technology (iTech)

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- National Institute on Drug Abuse (NIDA)
- National Institute of Mental Health (NIMH).

Each of these groups has played a pivotal role in the success of this network, and we are deeply grateful for their continued efforts and dedication.

**Thank you.**



## Key Terminology

Abbreviation	Definition
AYA	Adolescents and Young Adults
ART	Antiretroviral Therapy
CHTC	Couples-based HIV Testing and Counseling
CTR	Counseling, Testing, and Referral
DoxyPEP	Doxycycline Post-Exposure Prophylaxis
HIV	Human Immunodeficiency Virus
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer, and other identities
mHealth	Mobile Health
PrEP	Pre-Exposure Prophylaxis
RCT	Randomized Control Trial
SMRC	Subject Matter Research Consultants
STI	Sexually Transmitted Infection
TGE	Trans and Gender Expansive
YSMM	Young Sexual Minority Men
YSGM	Young Sexual and Gender Minority
YLWH	Youth Living with HIV

# Technology & HIV Among Adolescents and Young Adults in the U.S.

In 2021, despite efforts to reduce transmission, youth account for **1 in 5** of all new HIV diagnoses in the U.S.

One side of the story is that adolescents and young adults (AYA) are less engaged in the cascade of HIV prevention of strategies to stymie new transmissions, including:

- **Getting regular HIV testing** to raise awareness of one's HIV status and identify new cases of HIV.
- **Using preventative tools like condoms or PrEP** to prevent transmission of HIV during sex.
- **Entering HIV care** to receive appropriate antiretroviral treatment and other supports.
- **Achieving and maintaining viral suppression** prevention HIV transmission and ensure overall health and wellness.

**However, a deeper dive reveals that AYA also face a variety of challenges to effectively engaging in HIV prevention.**

HIV prevention programs and interventions need to account for the personal, social, and structural factors that shape young people's decision making, such as:

- competing priorities related to work or family
- stigma or homophobia from friends or family
- not knowing where to access HIV testing
- having the autonomy or ability to access services

**Digital interventions represent a promising opportunity to reach AYA**, such as providing remote access to PrEP counseling or tailored sexual health education with the convenience of a phone app.

In 2021, 95% of AYA reported having access to a smartphone. However, current commercially available apps have not been designed or evaluated for AYA.



## 1 in 3

of 18 to 24-year-olds have ever been tested for HIV compared to the national average (39%).

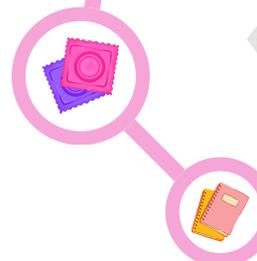
## 1 in 10

of people 24 and younger have been prescribed PrEP.



## 4 in 5

of 13 to 24 year-olds linked to HIV care, the lowest of any age group.



# About the ATN

**The ATN strives to support health and wellness of youth across the HIV prevention & care continuum through research, education, and advocacy.**

In 2001, the National Institutes of Health (NIH) started the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) to address the HIV prevention and treatment among adolescents and young adults in the U.S through collaborative interdisciplinary research.

Since then, we have brought together researchers, providers, and community members to develop and evaluate a variety of interventions tailored for youth ages 12 to 29 years, including:

- Behavioral (e.g. safer sex counseling)
- Prophylactic (e.g. injectable PrEP, DoxyPEP)
- Therapeutic (e.g. ART adherence)
- Technology-based (e.g. webtools, phone apps)

**As of 2021, we have recruited nearly 30,000 adolescents and young adults across 109 studies.**

**Over the years, we've learned that changing the HIV landscape requires focusing on high priority strategies.**

Persistent gaps across the youth HIV continuum highlight an increased need for emphasizing impact on clinical practice and improving understandings of the unique needs and challenges faced by young people.

To this end, we are committed to forging collaborations with federal agencies, local health departments, and youth consultants to break silos and ensure that research is refined, nimble, and relevant.

## **Current ATN areas of focus:**

- **Undiagnosed HIV.** Novel strategies to increase HIV diagnosis rates.
- **Persistent New HIV cases.** Safety, efficacy, and acceptability of new biomedical HIV preventives
- **Poor HIV Care Engagement.** Strategies leveraging collaborations to improve HIV care
- **Poor ART Adherence.** Safety, efficacy, and acceptability of new biomedical HIV treatments

## **ATN 113: PrEPare's Role in PrEP Approval for Minors**

ATN 113: PrEPare was a foundational open label study assessing the safety and tolerability of Truvada as PrEP among adolescents under 18. This study was also paired with another study, ATN 110, to assess PrEP among YSMM ages 18 to 22.

### **Key Findings:**

- PrEP was well tolerated with minimal safety concerns (e.g. kidney or bone issues)
- No cases of HIV transmission among participants with sufficient medication levels.
- Low medication adherence after 3 months.

ATN 113 demonstrated a need for developmentally appropriate strategies to support medication adherence among youth. It's safety and adherence findings contributed to the FDA's 2018 approval of Truvada as PrEP for adolescents under 18.



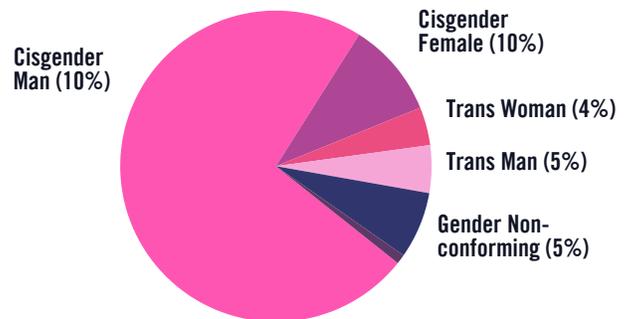
# A Snapshot of ATN Participant Baseline Demographics between 2016-21

In an effort to ensure that ATN recruitment efforts reflected populations most impacted by HIV, the ATN pooled together data from 3727 participants across 21 research studies. We then compared trends among ATN study participants against 2019 CDC surveillance data.

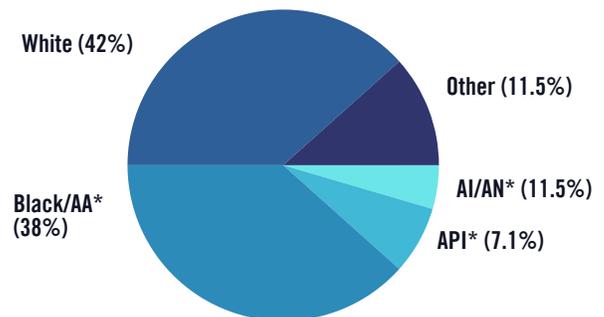
The following are several notable trends:

- **Age.** The average participant was about 21 years old, with about 14% being ages 13 to 18.
- **PrEP Uptake.** Most individuals were aware of PrEP (78%), but only 2 in 5 used PrEP currently or in the past.
- **HIV/STI Testing.** Among youth affected by HIV (n=3185), about 4 in 5 had never had an HIV test at the time of the study.
- **HIV Treatment.** The majority of YLWH (82%) were on ART, however, only 2 in 5 of YLWH were undetectable at the time of enrollment.
- **Socioeconomic Factors.** About half of participants were currently enrolled in school and/or employed. The majority (80%) had health insurance.

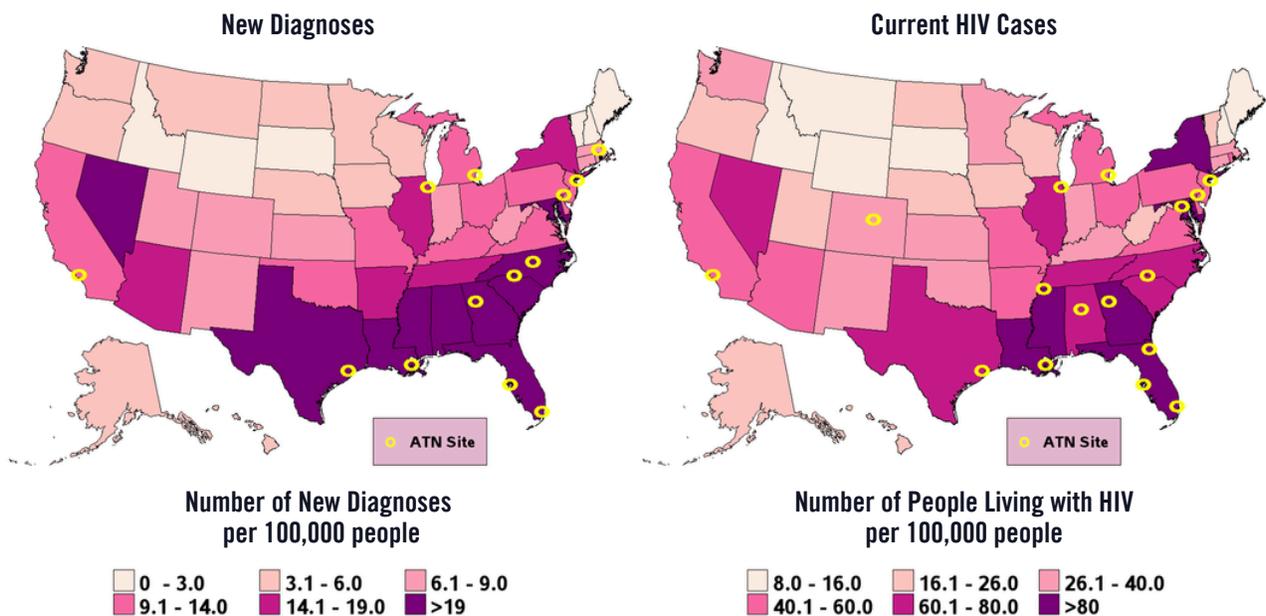
## Gender Identity



## Racial Identity



## Geographic Reach of ATN Study Sites Mapped alongside HIV Surveillance Data



\*AA: African-American; API: Asian and Pacific Islander; AI/AN: American Indian and American Native

# About the iTech Network

## Tailoring mHealth for Youth

Digital interventions like webtools or phone apps are well poised for supporting the unique needs and challenges of young people seeking HIV prevention and treatment. Although a number of sexual health apps are available on commercial sites, **there is limited data showing these tools were designed for or evaluated with youth in mind.**

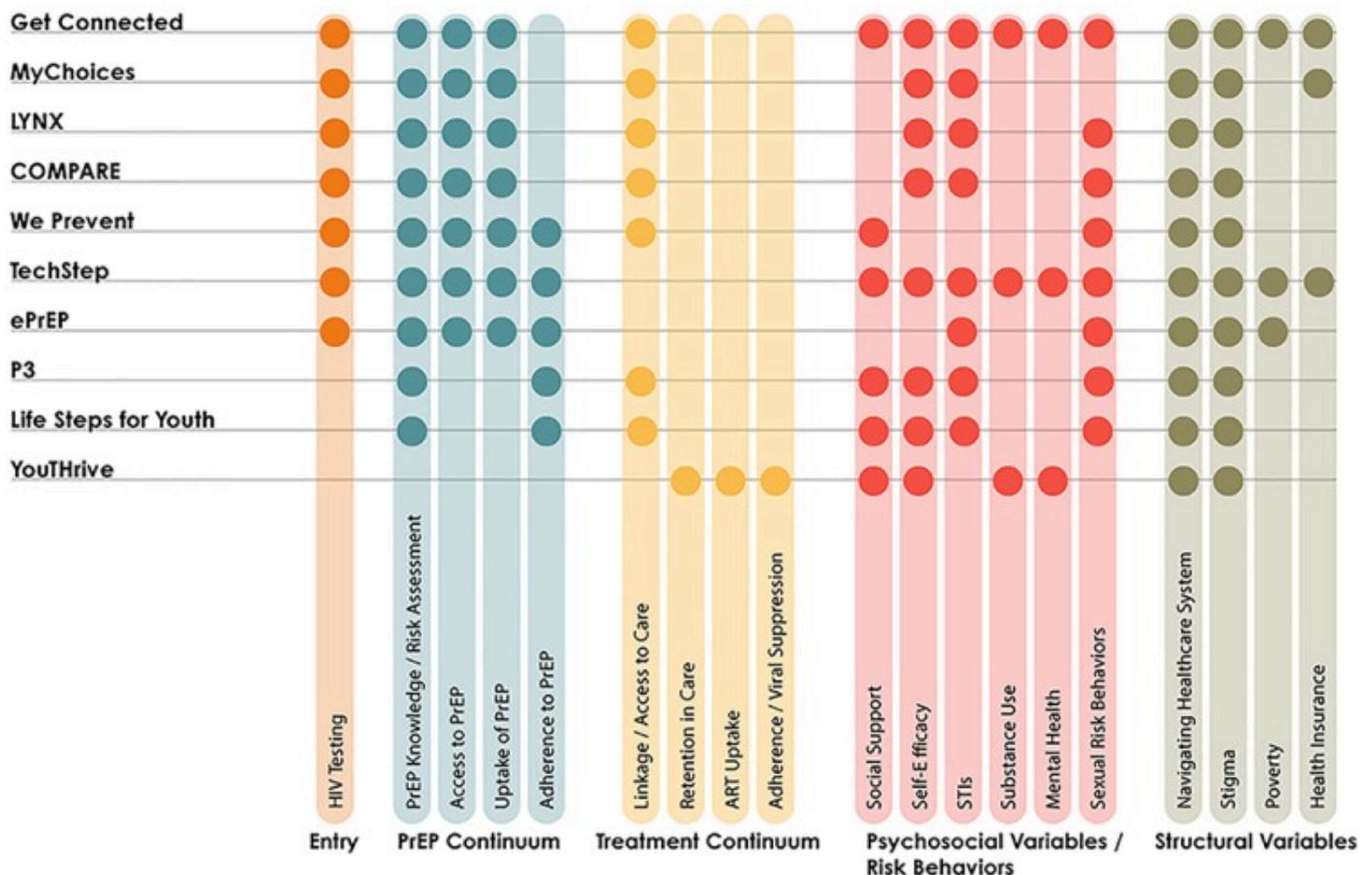
To address this gap, the Innovative Technology (iTech) Network was formed through a cooperative agreement between the National Institute of Health and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

**iTech aimed to conduct innovative, interdisciplinary research on technology-based interventions** across the HIV prevention and care continuum tailored to support adolescents and young adults in the U.S.

**Between 2016 and 2021, iTech developed and conducted 10 research studies to address 4 primary objectives:**

- 1 **Identifying HIV among youth**, including uptake of and adherence to HIV prevention such as HIV testing and PrEP.
- 2 **Designing multilevel, combination approaches** that integrate structural considerations for sexual and gender minority youth, in addition to youth facing other issues like substance use.
- 3 **Engaging YLWH in timely and optimal HIV care and treatment**, supporting ART adherence and viral load suppression.
- 4 **Increasing use and adherence to biomedical prevention strategies**, such as oral PrEP for HIV prevention and DoxyPEP for STI prevention

## iTech Studies Organized by Areas of HIV Prevention Research



# iTech Research Structure

iTech aimed to standardize the research process and develop more sustainable, technology-based solutions.

To effectively advance HIV prevention for youth, researchers need to ensure that digital tools are not only cutting edge but also meet a high standard of usability, affordability and accessibility for AYA and adjacent stakeholders, like providers and counselors.

To this end, we collated interventions that shared common principles, design elements, data collection, and evaluation approaches. This facilitates a more efficient and scalable process that can be applied to other evidence-based digital interventions.

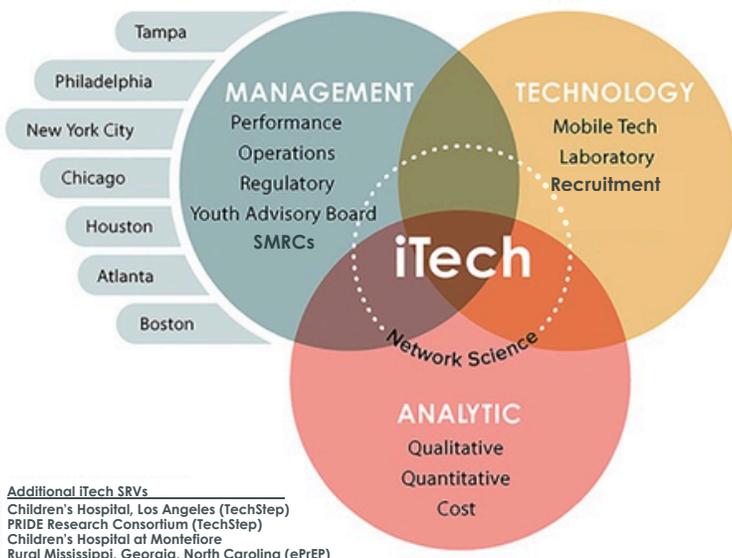
## Core Steps for iTech Studies included:

- **Qualitative formative studies** to develop or adapt an intervention.
- **Technical pilots** to test the usability and feasibility of an intervention.
- **Randomized control trials** to assess the efficacy of an intervention compared to standard of care.
- **Qualitative exit interviews** to understand participant experiences with an intervention.

iTech had a diverse network of researchers, healthcare, and community stakeholders to support its research.

## Key groups included:

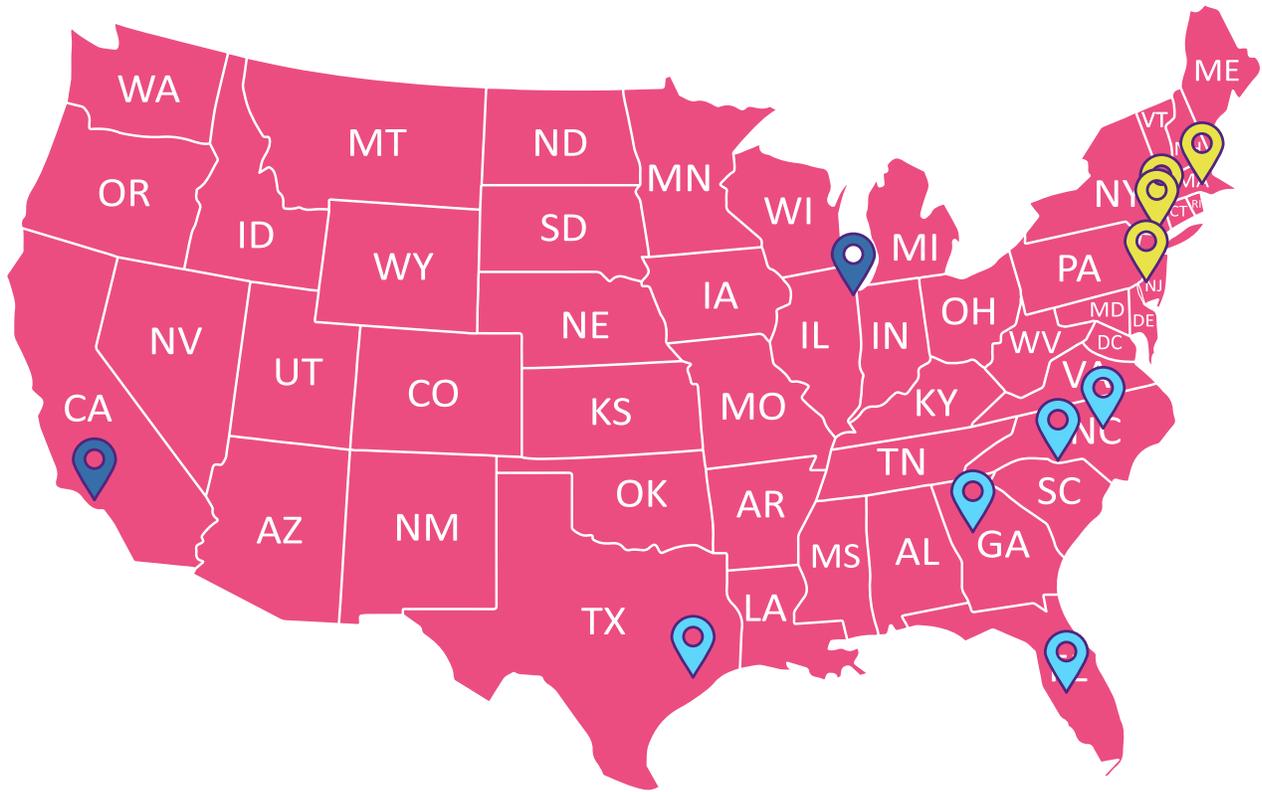
- **Principal Investigators (PIs).** PIs were responsible for managing different aspects of a study, including the design, execution, compliance and data analysis.
- **Study Recruitment Venues (SRVs).** In partnership with iTech, SRVs were hospitals, community health centers, or other similar organizations responsible for recruiting and retaining study participants in iTech studies.
- **Scientific Leadership Cores (SLCs).** See below for more information on essential infrastructure and support provided by SLCs.
- **Youth Advisory Boards (YABs).** We worked with clinical care sites to engage local youth and evaluate tools and programs for appropriateness, cultural sensitivity, and minimal burden.
- **Subject Matter Research Consultants (SMRCs).** Similar to YABs, SMRCs were local youth brought on as part-time consultants to provide more direct feedback on research projects.



## iTech had three key cores to manage overall research activity.

- **Management Core.** Responsible for project management, regulatory and operational support, and monitoring.
- **Analytic Core.** Provided expertise and data systems throughout each study phase to maintain scientific rigor.
- **Technology Core.** Provided services like app design and maintenance, social media recruitment, and paradata analysis.

# iTech Study Recruitment Venue Locations in the U.S.



## Northeastern U.S.

**Boston, Massachusetts**  
*The Fenway Institute*

**New York City, New York**  
*Hunter College Pride Research Consortium*

**Philadelphia, Pennsylvania**  
*Children's Hospital of Philadelphia*

**Bronx, New York**  
*Children's Hospital at Montefiore*

## West & Midwestern U.S.

**Chicago, Illinois**  
*Cook County Health*

**Los Angeles, California**  
*Children's Hospital Los Angeles*

## Southern U.S.

**Atlanta, Georgia**  
*Emory University*

**Chapel Hill, North Carolina**  
*University of North Carolina Chapel Hill*

**Charlotte, North Carolina**  
*RAIN, formally known as the "Regional AIDS Interfaith Network"*

**Houston, Texas**  
*Baylor College of Medicine, Texas Children's Hospital*

**Tampa, Florida**  
*University of Southern Florida*

# List of iTech Studies

Below is a list of completed iTech studies with primary findings summarized later in this report.

## ATN 138: YouThrive

*Keith Horvath, PhD (San Diego State University) & K. Rivet Amico, PhD (University of Michigan)*

YouThrive was a two-arm RCT to test the efficacy of an adapted version of the Thrive with Me intervention for YLWH. The multi-component web app aimed to improve ART adherence among youth living with HIV

## ATN 139: Get Connected

*José Bauermeister, PhD (University of Pennsylvania)*

Get Connected was two-arm prospective RCT testing a motivationally-based, tailored webapp that provided personalized linkage to high-quality HIV prevention and care services for YSMM.

## ATN 140: LYNX

*Albert Liu, MD, MPH & Hyman Scott, MD, MPH (San Francisco Department of Public Health)*

LYNX was a novel mobile app designed to increase HIV or STI testing and support PrEP uptake among YMSM. It expanded a previous mobile app, designed to increase HIV/STI testing and PrEP use among YSMM.

## ATN 141: MyChoices

*Katie Biello, PhD, MPH (Brown University) & Kenneth Mayer, MD (The Fenway Institute)*

MyChoices was a youth-optimized version of a mobile app designed to increase HIV or STI testing and support PrEP uptake among YSMM. Similar to LYNX, MyChoices expanded and enhanced the original app through testing with youth.

## ATN 142: P3

*Lisa Hightow-Weidman, MD, MPH (Florida State University)*

P3 was a three-arm RCT testing P3, a novel, theory-based mobile app that used game mechanics and social networking to improve PrEP adherence and retention in PrEP clinical care among YSGM.

## ATN 143: COMPARE

*Katie Biello, PhD, MPH (Brown University) & Albert Liu, MD, MPH (San Francisco Department of Public Health)*

COMPARE examined efficacy differences in HIV testing and PrEP uptake between LYNX and MyChoices. While both apps addressed HIV prevention among YSMM, each app had slightly different components, messaging, and approaches

## ATN 157: We Prevent

*Kristi E. Gamarel, PhD (University of Michigan)*

We Prevent was an RCT examining a remote, relationship-skills intervention that adapted couples HIV testing and counseling for YSGM.

## ATN 160 TechStep

*Cathy Reback, PhD (Friends Research Institute) & Keith Horvath, PhD (San Diego State University)*

TechStep was a two-arm RCT evaluating a tech-based, stepped care intervention to support HIV testing and PrEP uptake among YSGM. The full intervention consisted of a web app texting and online coaching.

## Other Studies

The following are other iTech studies that are still awaiting complete analysis. Findings will be updated as available.

- **ATN 158: LifeSteps for PrEP for Youth (LSPY).** An evidence-based adherence intervention adapted for PrEP adherence among YSMM.
- **ATN 159: ePrEP.** A home-care system YSMM in Mississippi, Georgia, and North Carolina starting and maintaining PrEP care.
- **ATN 163: DREAM.** Safety and acceptability study for a novel HIV prevention douche among YSMM.

# Can a WebApp improve how young people take their HIV medication?

## Primary findings for ATN 138: YouThrive

Led by Keith Horvath, PhD (San Diego State University) & K. Rivet Amico, PhD (University of Michigan)



## Youth living with HIV (YLWH) face a number of challenges to reaching an undetectable viral load.

These include access to youth-centered HIV healthcare, insurance costs, and transportation to and from clinic appointments. Mental health challenges such as HIV stigma can also negatively impact how people navigate taking HIV medications every day.

Although there are programs to encourage people to take their HIV medications as prescribed, most are tailored for adults and have shown limited impact. Considering that the majority of US-based youth have access to mobile phones, laptops, and other devices, there's an increased recognition digital tools are well positioned to encourage HIV medication adherence among YLWH.

## YouThrive explored ways to provide virtual support networks that bypass geographic limitations.

For example, social media is an important way of connecting among AYA. Digital interventions can integrate online networking to provide social support as youth grapple with HIV care needs. This strategy can also help meet the high demands of social and emotional development in early adulthood.

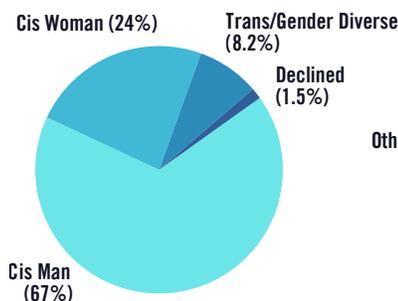
Based on *Thrive With Me*, a tailored webapp developed by the same study team focused on improving ART adherence among adults, **the YouThrive study sought to adapt TWM for YLWH to assess if participants using YouThrive would:**

1. Achieve sustained viral suppression, and
2. Be more beneficial for YLWH who use substances.

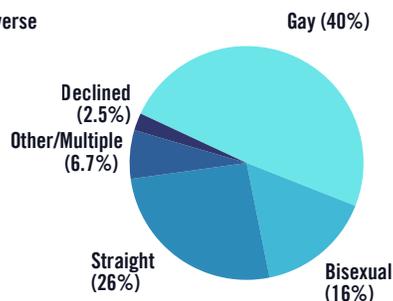
## Who participated in YouThrive?

Between August 2019 and December 2021, 208 participants, ages 15 to 24, enrolled in the YouThrive study across 8 ATN sites in the U.S. Individuals were recruited through clinic referrals and ads on social media platforms, like Instagram and dating apps.

### Gender Identity



### Sexual Identity



## Two in three participants were between 21 to 24 years old.

### Other demographics at the start of the study include:

- About two-thirds of participants identify as Black, with White as the next most common racial identity (16%).
- Just over half (54%) of participants were enrolled in school.
- About 1 in 4 (23%) participants were experiencing housing instability when entering the study.
- About 2 in 3 participants were single and not in relationships.

## Developing the YouThrive Webapp

After conducting 6 focus groups for suggestions on how to adapt the original intervention for YLWH, we worked with a technology partner to design, test, and finalize the YouThrive webapp. The app would be designed as a safe space for YLWH to share information and reflect on sexual health choices.

The final version of the YouThrive webapp offered a variety of tools including:

- Peer interactions,
- Daily content on living with HIV,
- Personal HIV medication adherence tracking, and
- Goal setting.

## YouThrive Study Experience

After enrollment, participants were randomly assigned to receive either the YouThrive webapp or a weekly email newsletter that had information about relevant topics (e.g. mental health) but no information about adhering to HIV medications. The intervention lasted for 5 months, after which participants completed a survey. Over half (58%) had their viral load measured.

**Most people trusted information on YouThrive, rating it as helpful, but felt like it could be improved.**

83%

trusted the information  
in YouThrive

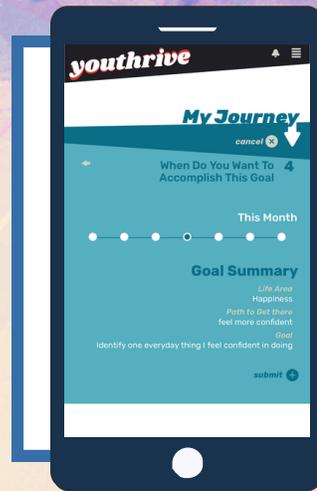
67%

would recommend  
YouThrive to a friend

“It allowed me to visually realize and set accountability not so much a reminder but a clear understanding of changes I need to make to be healthier.”

“It was a very usefully tool at first but not so much after awhile. It's missing some flow. [...] It would help if I received a daily notification at a specific time.”

## Examples of YouThrive Features



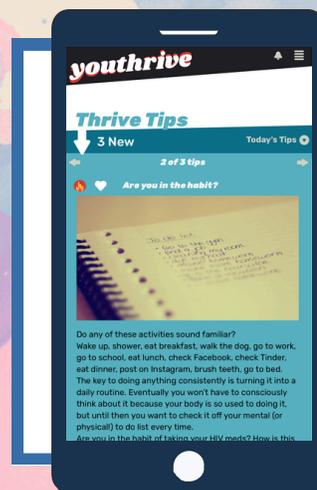
### Message Posting

Participants could directly and voluntarily post and respond on a single, shared feed. This is similar interacting in an in-person, peer support group.



### Monitoring Tools

YouThrive had multiple features to help users track their medication dosing, mood, and personal goals with helpful reminders and regular feedback.



### Educational Content

Users received daily tips, videos, or image-based content, like memes, to provide strategies and support related to HIV, healthy sexuality, and other topics important for YLWH.

## What did researchers learn?

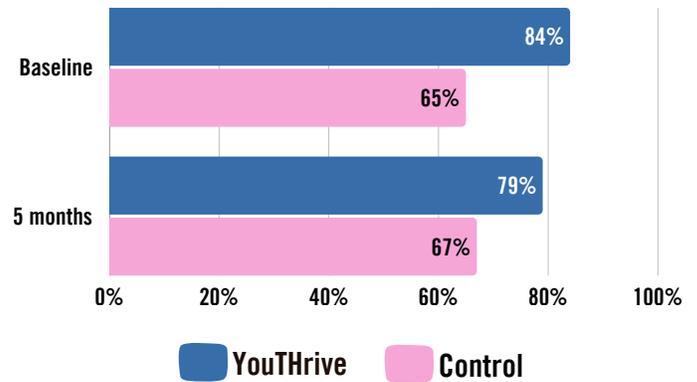
Among participants who got the YouThrive webapp or newsletter control condition, researchers found that:

- 1 Most participants had an undetectable viral load (<50 copies) at the start of the study.** After 5 months, viral loads were still similar with no significant change between both groups.
- 2 In fact, nearly 2 in 3 participants entered and remained virally suppressed throughout the study.** Around 11 participants went from an unsuppressed to a suppressed status, with the majority being from the control group.
- 3 The newsletter control condition might have had a stronger effect than expected** when it came to how YLWH manage their medication. Many youth felt overburdened by COVID-19, possibly paying more attention to the newsletter.

Overall, there was no evidence that YouThrive improved ART adherence or viral suppression among youth in this study, including those who used substances.

However, there are several factors that could have affected YouThrive's impact or relevance among the group. For instance, the study had a relatively small sample size, with a large percentage of youth starting already virally suppressed. Additionally, the COVID-19 pandemic caused a major interruption of this study, which could have impacted the results.

Proportion of Participants with an Undetectable Viral load after 5 months (n= 120)



## Key Takeaways

YouThrive does not appear to increase how often YLWH take their HIV medication. Considering the limitations, the webapp cannot be definitely recommended as an intervention to support HIV medication adherence among YLWH.

However, future research might consider combining webapps like YouThrive with more intensive interventions.



*“It makes me really happy that there’s stuff out there for people like me*

*Sometimes I feel lonely... it was cool to remember it’s not just me. I wish other people used it more.”*

# Using Mystery Shopping to Tailor HIV Prevention

Primary results for ATN 139: Get Connected

Led by José Bauermeister, PhD (University of Pennsylvania)



**Digital interventions bring a promising level of access and convenience that can address many challenges at once.**

Young sexual minority men (YSMM) use the internet to learn about their sexuality, meet partners, and navigate their sexual health. **Digital interventions can help not only meet YSMM where they're at, but also:**

- Tailor content to individual characteristics
- Bring services to folks in remote areas
- Address personal changes, like entering a new relationship or experimenting

Testing locators are a perfect example of this. They can provide users with a comprehensive list of physical locations near them to receive HIV testing.

**YSMM are more motivated to engage if services are high-quality, affirming, and tailored to their needs.**

However, most quality assurance strategies offer a limited understanding of young clients' experiences. This makes it difficult to ensure that listed resources are, in fact, affirming and prepared to serve YSMM.

**Mindful of this systemic shortcoming, researchers designed a browser-based webapp to motivate YSMM to engage in HIV prevention strategies.**

What made Get Connected unique is that it incorporated youth-driven data to continually evaluate the quality of listed resources. In the Detroit-based pilot, people who used Get Connected saw short-term benefits when it came to HIV testing and other HIV prevention strategies.

**To see if the webapp would be effective over longer periods of time, ATN 139 Get Connected recruited 285 YSMM in Philadelphia, Atlanta, and Houston** through online ads, referrals, and in-person outreach.

The study aimed to understand **if people using the Get Connected webapp for 12 months would:**

- Get HIV testing at least twice
- Get STI testing at least twice
- Use PrEP across 12 months.

## Participant Demographics at Baseline

**When it came to HIV testing,**

**4 in 5** had taken at least one HIV test in their life.

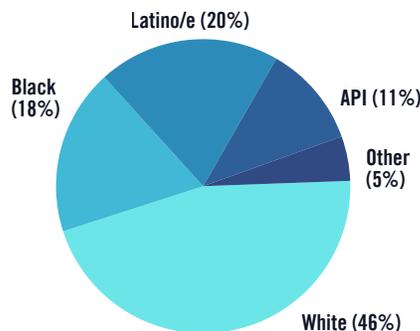
Nearly half of which had an HIV test in the 3 months before starting the study.

**When it came to STI testing,**

**2 in 3** had taken at least one STI test in their life.

A third of these individuals have had an STI diagnosis in the past.

### Racial Identity



**Other demographics include:**

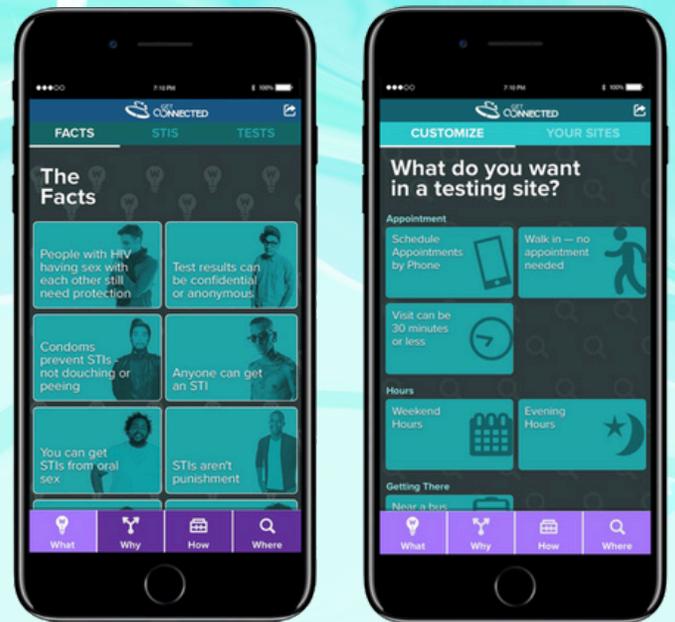
- Participants' average age was about 21 years old.
- Four in 5 (85%) people lived in Atlanta or Philadelphia.
- One in 2 (49%) people were single at enrollment.
- About 1 in 5 (17%) were living alone.
- About 2 in 5 (17%) had faced food insecurity.

# Get Connected Webapp

## Main components include:

- 1 **“What,”** outlining general information about HIV, STIs, and testing methods.
- 2 **“Why,”** encourages users to explore their motivations and values for HIV/STI testing.
- 3 **“How,”** provides information to think through potential barriers and priorities.
- 4 **“Where,”** allows customized search of sites offering local CTR services.

Throughout the process, content was tailored to users’ characteristics (e.g., age, relationship status), sexual health (e.g. testing history, recent condomless sex), and other important factors.



## Using youth-driven mystery shopper strategies to evaluate HIV services.

Mystery shopping is a process where professionals anonymously visit a store, restaurant, or, in this case, clinics offering HIV Counseling, Testing, and Referral (CTR) services to understand clients’ experiences.

For this phase, **24 YSMM were recruited to conduct mystery shopper visits** and assess CTR services at 76 HIV testing sites in Philadelphia, Atlanta, and Houston. The process for mystery shopping consisted of:

1. **Identifying sites** offering walk-in appointments for free, rapid HIV testing.
2. **Training participants** on the mystery shopper process and HIV prevention basics.
3. **Two shoppers visiting** each site twice for HIV testing at different times of the days.
4. **Shoppers completing an online survey** after each visit using data and their own words.
5. **Study team sending a report** to each site with comparisons and recommendations.

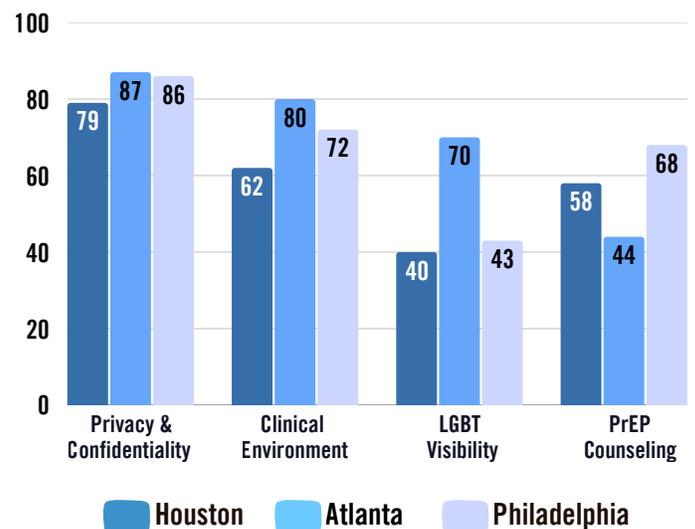
Most sites scored well when it came to privacy and confidentiality. However, **there were key differences across agencies in the three cities** when it came to clinic environments, LGBTQ+ imagery and materials, and counseling on safer sex, HIV, and PrEP.

## Mystery shopper data informed how Get Connected tailored resources for users.

Using the information collected by mystery shoppers, the webapp was able to provide resources that users could customize according to their needs, such as walk-in availability, weekend hours, and insurance.

As users visited sites, they were asked questions about their testing experience at follow-up appointments. Scores were used to update site information.

**Average Mystery Shopper Scores across HIV Testing Sites (n=76)**



## Get Connected Study Process

During enrollment, participants completed a baseline survey. Once completed, participants were randomly assigned to receive one of two interventions:

- GC-PLUS, the full-version with tailored content
- GC-TLO, which only included the testing locator (TLO) and served as the control condition.

Participants had access to the GC webapp for 12-months and were asked to complete virtual follow-up surveys every 3 months.

## Overall, participants consistently rated both interventions as high.

At the 3-month and 12-month mark, participants were briefly surveyed to learn more about their opinions on usefulness and user-friendliness.

Throughout the study, participants scored **GC-PRO better when it came to information quality**. They also rated GC-PRO as **more comparably useful**, but this fell off over time. There was no difference when it came to whether they'd use the app in the future if available.

## Across both interventions, most people had regular HIV/STI testing.

**2 in 3**

got at least one HIV test over the past 12 months

**2 in 5**

received at least two HIV tests over the past 12 months

**1 in 2**

got an least one STI test over the past 12 months

**1 in 3**

received at least two STI tests over the past 12 months

Generally, this increase in HIV/STI testing frequency shows that Get Connected had a positive impact on how participants engage their sexual health, especially when compared to when they first started.

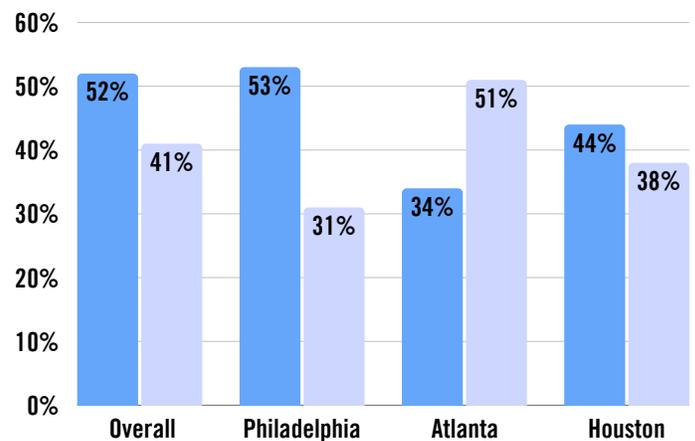
The lack of a true control group (meaning, no treatment) made it hard to test the efficacy of the webapp. However, we felt it would have been unethical to not give individuals access to vetted resources.

## Individuals benefited from the webapp differently depending on where they lived.

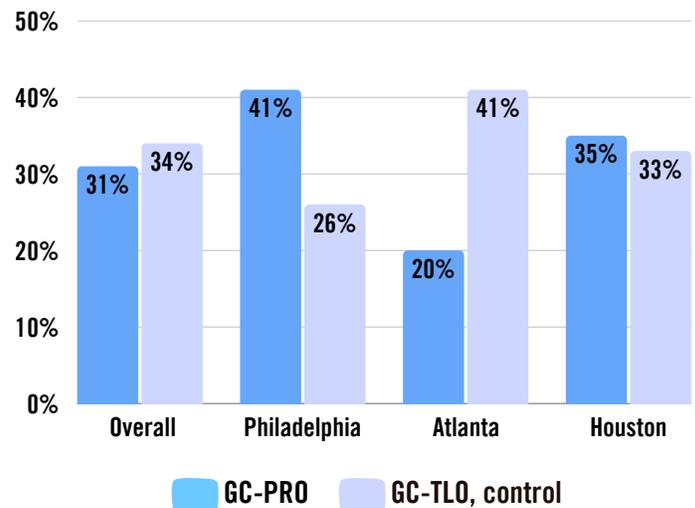
Among participants who received either webapp, there were several meaningful trends among each city:

- 1 **Participants in Philadelphia using GC-PLUS were 2.5 times more likely to get an HIV test** than their peers using GC-TLO. There was no difference among folks in other cities.
- 2 **People in Atlanta using GC-TLO were twice as likely to get an STI test** than their peers using the full-webapp, GC-PLUS (41% vs 21%). This pattern was not seen among users in other cities.

**% of Individuals Who Got HIV Testing Across 12-months, by Group and City (n=285)**



**% of Individuals Who Got STI Testing Across 12-months, by Group and City (n=285)**



## People who often used the webapp over 12 months had higher testing rates but still varied by city.

Among those who received either app, there were several other trends related to webapp engagement:

 **6** logins on average over 12 months

- 1** People who logged into GC-PLUS more often saw a slight increase in HIV testing. Frequent users in Atlanta were 20% more likely to get an HIV test than their peers in other cities.
- 2** People who logged into GC-PLUS also saw similar increases in STI testing. Frequent users in Atlanta were also more likely (27%) to get an STI than their counterparts in other cities.

## Taken together, these findings show that digital interventions cannot be designed as a “one size fits all.”

Some users of the webapp may simply need a test locator, while others may benefit from additional resources and content tailored to clients’ needs.

We found that participants living in each city used the webapp differently, likely **shaped by factors that made following through with testing plans harder or easier.** Examples include transportation, state & local policies, and healthcare access.

For example, mystery shoppers found that Philadelphia had a higher number of youth-friendly HIV/STI testing sites than Houston or Atlanta. This means that **users in Philadelphia could have had an easier time walking into a clinic for free testing without needing a parent or insurance.**

## Key Takeaways

HIV/STI testing is often an individual's first experience with prevention services. Digital interventions like Get Connected can ensure that YSMM’s first test is a positive experience and establish confidence in HIV prevention services.

### Make Get Connected Nationwide

Overall, Get Connected is an effective webapp to motivate YSMM to get tested for HIV and STIs at least twice per year, as recommended by the CDC. The research team is exploring how to make the WebApp available to youth across the U.S.

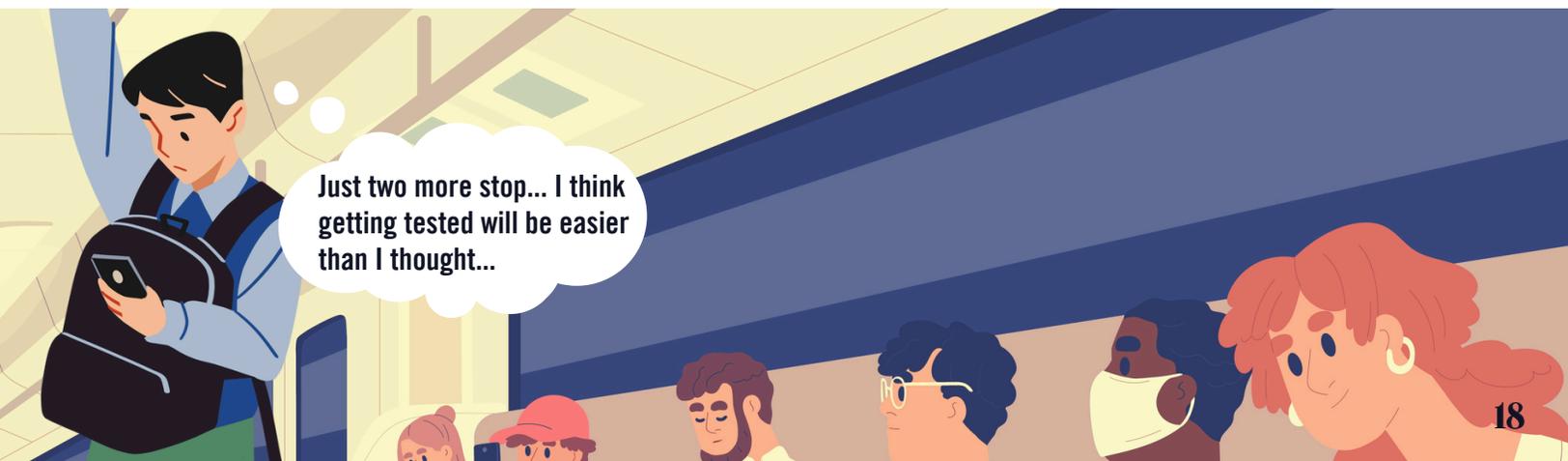
### Adopt Regular Quality Assurance Practices

Mystery shopping findings revealed opportunities for agencies to improve how CTR services meet the needs of YSMM. Organizations should consider using similar strategies to address gaps for other populations, like trans women, and the rest of the HIV care continuum.

### Use Tailored Algorithms for HIV/STI Testing

Get Connected was designed to match YSMM to high-quality services near them. By leveraging technology to tailor content, digital interventions like Get Connected can effectively reach diverse populations, adapt to user needs in real-time, and provide scalable solutions to encourage HIV/STI testing.

To read more about the Get Connected mystery shopping intervention, you can read [this “how to” guide](#) to learn more about mystery shopping strategies



# Can a tailored mobile app improve how young people take daily PrEP?

Primary finding results for ATN 142: PrEPared, Protected, emPowered (P3)  
Led by Lisa Hightow-Weidman, MD, MPH (Florida State University)



## Young SGM are more affected by HIV compared to other groups.

Pre-exposure prophylaxis (PrEP) has been proven to be an effective and safe way to prevent HIV among young sexual and gender minorities (YSGM), including sexual minority men (SMM) and trans women. Many people who could benefit from PrEP are not on PrEP or do not take the medication as prescribed. Not taking PrEP as prescribed reduces its effectiveness in preventing HIV.

However, current tools and programs meant to help young people to start and stay on PrEP use are limited and yet to be proven effective. Most interventions are not tailored to address young people's unique developmental needs and challenges.

## With the increased use of smartphones, app-based strategies provide new ways to support the sexual health decisions of young sexual and gender minorities.

P3 (Prepared, Protected, emPowered) study aimed to build upon previous mobile app research to design an app that met the complex and unique needs of young SMM and trans women aged 16-24 years starting or taking PrEP.

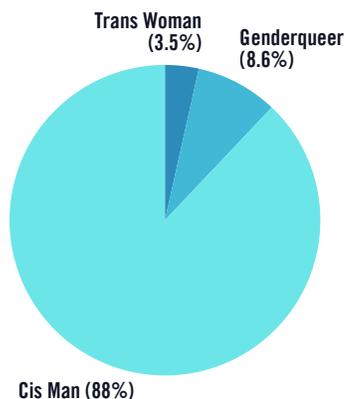
### Researchers wanted to see if the P3 study would:

- Improve how youth followed their PrEP regimen
- Impact how they navigate sexual health, and
- Provide a positive experience.

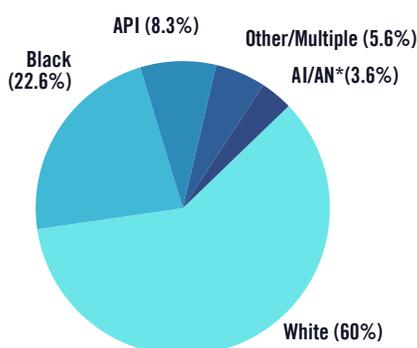
## Who participated in P3?

Between 2019 and 2021, researchers recruit 246 sexual minority men and trans women aged 16 to 24 across 9 cities in the US. All participants were beginning PrEP or already on PrEP at the time of starting the study.

### Sexual Identity



### Racial Identity



\*API: Asian and Pacific Islander; AI/AN: American Indian and American Native

## Most participants had used PrEP before but faced challenges to stay adherent.

 **88%** took PrEP at least 60% of the time in the past month

 **44%** said forgetting was a top issue for taking PrEP

 **23%** were unable to attend appointments or continue seeing their PrEP provider

 **77%** started PrEP to take control of their sexual health

## P3 Intervention Details

After enrolling, participants were randomly assigned to receive one of three intervention conditions for three months and then were asked to complete follow up assessments for 3 more months.

### The P3 mobile health app offered:

- **Medication Reminders** with personalized habit building suggestions
- **Social Wall** with daily prompts to promote learning and sharing among peers
- **Games and Daily Quests** to set goals, build skills, and test knowledge
- **Knowledge Center** with information about HIV, safer sex, relationships and more

Researchers also tested another version of the P3 app called "P3+" which had the same features as the original app with the addition of in-app coaching.

P3+ users had access to one-on-one coaching sessions with a peer counselor to identify and troubleshoot challenges to taking PrEP.

### Most participants enjoyed using the

**P3 app.** The majority (88%) of people said that they were very satisfied with the app, and that (85%) would recommend it to their friends. A smaller group of participants who used P3 were interviewed at the end of the study to see what they liked and found helpful about the P3 app. Here are examples of what they said.



*When I had that counselor I felt a bit better about myself... If I had a question, or I just need to talk a little bit about a situation it definitely made me feel better and less alone. Some things you don't want to tell a friend. you need someone else. (Boston participant)*



*At first, I didn't know all of this information – all of the articles and the research studies – that was a little scary to undertake. But it's given me the opportunity and the information to learn more about it [PrEP] on my own time. (Chicago participant)*



## How did participants use the P3 app features?

Using participants' app data, researchers observed the following trends from the first 90 days of the study:



**67**

Average number of days individuals logged into P3



**5.3**

Average number of minutes spent using the app per login



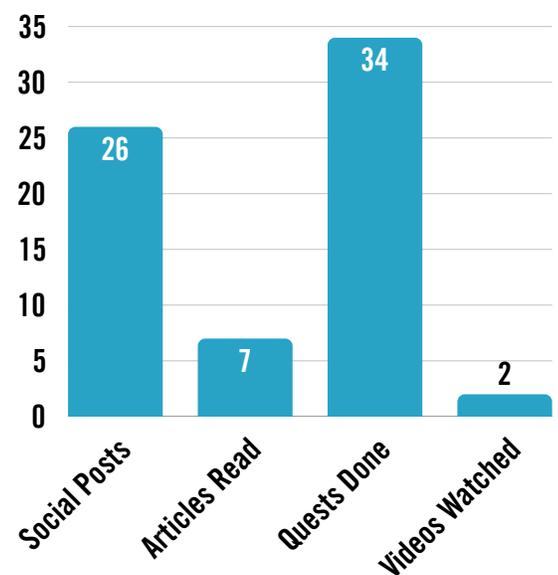
**76**

Average number of days folks used the PrEP medication tracker

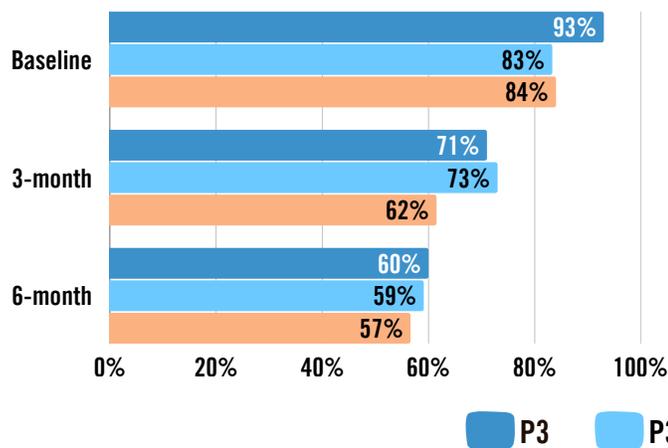
However not everyone used the medication tracker the same way. About 38% of people used the tracker with high consistency, or more than 7 times in a two week period.

**Other popular features among users were the social wall and quests features.** Quests encouraged users to learn about sexual health, often prompting users to read educational articles or watch videos.

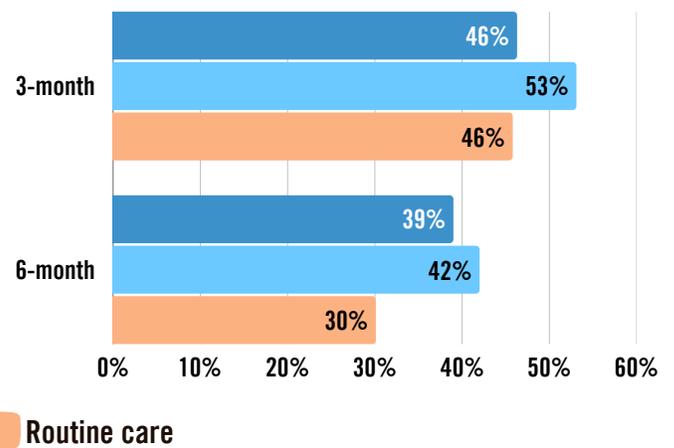
Average Number of Times Participants Used App Features



**Reported taking PrEP at least 4 days in the past 7 days (n=246)**



**Had a PrEP medical visit in the past 3 months (n=246)**



## Overall, participants who received the P3 intervention saw short-term improvements in PrEP use.

Among participants who received P3 and P3+ with coaching, researchers found that:

- 1 After 3 months, participants who used P3 and P3+ with coaching reported **improved PrEP use compared to those who did not have access.**
- 2 Dried blood spot samples, or tests that measure medication levels in a person's bloodstream at a specific point in time, **confirmed the reported increase in adherence.**
- 3 Participants who consistently **used P3's PrEP medication tracker feature were more likely to take PrEP over a 3-month period.**
- 4 Participants using P3 and P3+ with coaching were **more likely to have attended at least one PrEP medical visit in the past 3 months.**

However, participants using P3 did not see a large improvement in their PrEP use after 6 months. There were a number of factors that could have affected the results of the study, including the diversity of participants, where they live, how they were recruited (e.g. online), and challenges related to COVID-19.

## Key Takeaways

### Collaboration is key

It is important to work with youth to make apps that actually engage and excite users. Features like virtual rewards and daily quests were added because of field testing feedback.

### Thinking long-term

P3 had a positive impact on youth starting PrEP but we need more research on how to support youth who may want to stay on PrEP for longer periods of time.

### Promoting mHealth to Providers

Apps are dynamic and useful resource, and providers should consider recommending the use of an app to help track PrEP adherence when discussing PrEP adherence with young patients.

# At-home HIV testing? There's an app for that . . . well, two!

Primary finding results for ATN 143: COMPARE

Led by Katie Biello, PhD, MPH (Brown University) & Albert Liu, MD, MPH (San Francisco Department of Public Health)



**HIV testing is essential for detecting and treating HIV early. It also decreases the chance of onward HIV transmissions.**

Young sexual minority men (YSMM) face among the highest rates of HIV. While we know that routine HIV testing and PrEP are effective, YSMM have also had low rates of HIV testing and PrEP use.

To increase widespread acceptance of these strategies, HIV prevention programs and interventions need to consider the unique challenges that shape young people's decision making, such as:

- competing priorities related to work or family
- stigma or homophobia from friends or family
- not knowing where to access HIV testing
- lacking the autonomy or ability to access services

**App-based interventions offer a great opportunity to address some of these barriers among YSMM.**

**95%**  
of youth have a smartphone

From tailored educational content to remote access to services, evidence-based digital interventions can use app-based tools to provide convenient and evidenced-based support for YSMM navigating HIV prevention.

ATN researchers used different theoretical models to design two distinct apps, LYNX and MyCHOICES, to address the HIV prevention needs of young people.

The goal of the COMPARE study was to see how well the LYNX and MyChoices apps increased HIV testing and PrEP use among YSMM.

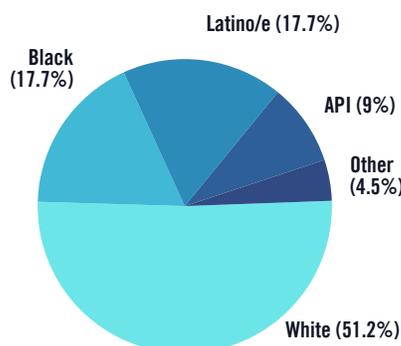
## Who participated in COMPARE?

Between 2019 and 2022, researchers recruited 380 cisgender sexual minority men aged 16 to 24 across 9 cities in the US. All participants were not on PrEP or had not recently taken an HIV test at the time of enrollment.

### Participant Demographics

- The average age was 22.
- 1 in 2 people lived in the Southern U.S.
- 3 in 5 identified as gay
- 1 in 3 were working a full-time job
- 3 in 5 were currently enrolled in school
- 1 in 2 were under their parents' insurance plan

### Racial Identity



## A third of participants had never had an HIV test before.

**85%** had never used PrEP before the COMPARE study

**40%** had recently had condomless sex before entering the study

**67%** were single or casually dating someone

**78%** were enrolled after the COVID-19 shutdown

\*API: Asian and Pacific Islander

## Developing the Interventions

While the MyChoices and LYNX apps were created by different study teams, both apps were designed and piloted using similar methods including (1) interviews and focus groups with YSMM, (2) beta testing, and (3) small-scale studies.

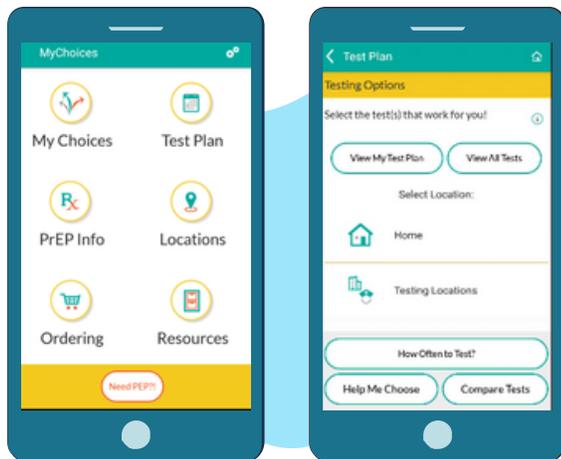
Both apps worked as intended and were received well by young participants. However, researchers needed to test the apps with a larger group of people to determine their overall effectiveness.

## COMPARE Study Process

After enrolling, participants had an equal chance to get the LYNX app, MyChoices app, or the standard of care (informational pamphlets). Staff then provided a brief demonstration of app features.

Participants also completed self-administered surveys at three different points: when enrolling into the study, after 3 months, and after 6 months. People enrolled before June 2021 were eligible for an additional follow-up survey between 7 and 12 months.

### App #1: MyChoices



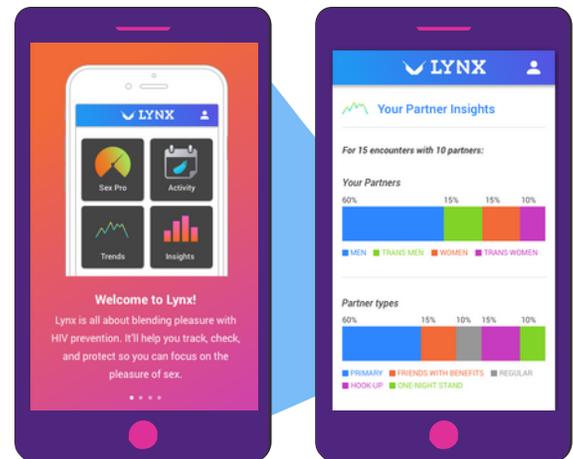
#### How did MyChoices work?

When it comes to adopting a behavior, people often need to feel capable in their abilities and look to learn from others first. Informed by this idea, the MyChoices app offered users chances to see how other people navigate the ups and downs of HIV testing and PrEP. It also had features to encourage users to build skills themselves, and therefore their confidence too!

#### Key Components

- **Sexual health education** via infographics, videos, weblinks to educational resources
- **Access to prevention tools** like at-home HIV and STI testing kits, condoms, and lube
- **HIV prevention plans** with regular check-ins
- **Reminders for HIV testing** with geolocation-based notifications when near testing sites
- **GPS-enabled resource maps** with local testing locations and PrEP providers

### App#2: LYNX



#### How did LYNX work?

In order to change a behavior, people need to know what to do, have the motivation to try, and have the skills to actually perform it. The LYNX app built on this by providing a suite of tools to support users' knowledge, motivation, and skills.

#### Key Components

- **Sexual Health Promotion (Sex Pro) score** that provides a personalized HIV risk score
- **Sex diary** to help users track and visualize trends in sexual partners and activities
- **Access to prevention tools** like at-home HIV and STI testing kits, condoms, and lube
- **GPS-enabled resource maps** with local testing locations and PrEP providers
- **PrEP information page** including a roadmap on how to get on PrEP
- **Two-way chat** provides real-time assistance

# HIV/STI Self-Testing Kit Process

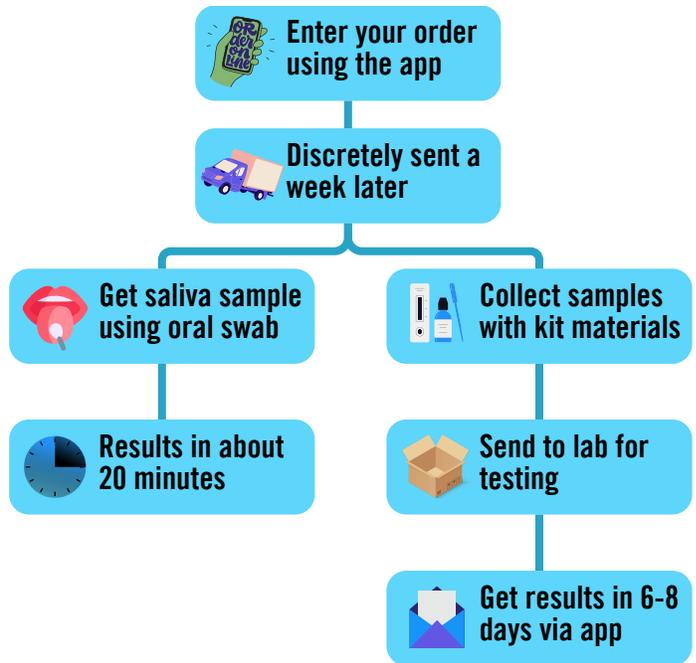
## How did people order kits?

Both apps had designated pages for participants to directly place orders for HIV & STI self-testing kits, in addition to free condoms, lube, and other safer sex supplies. Orders were delivered to their place of choice within 3-10 days in discrete delivery boxes.

- Of those that ordered HIV tests, 3 in 4 actually used the kits.
- In contrast, only about 13% of STI kits were returned for lab processing.
- Top reasons for not using the kits were a preference for clinic-based testing or not having the time.

**1 in 2**  
ordered an HIV and/or STI self-testing kit

**74%**  
reported in-app ordering as helpful



## People who used MyChoices or LYNX had promising rates of HIV testing and starting PrEP.

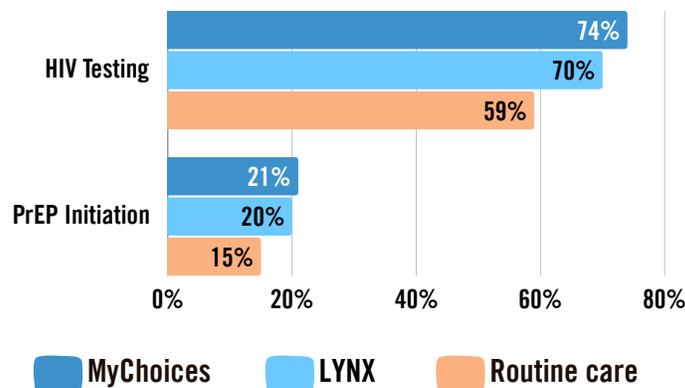
Among participants who received either app, there were several notable trends related to HIV testing:

- Both apps increased the likelihood of having an HIV test in the past 6 months**, but only the MyChoice showed a reliable difference.
- Both apps increased HIV testing rates among White users.** While there was no major change among non-White users, this is likely impacted by the small sample of non-White participants.
- People who enrolled after the COVID-19 shutdown saw many benefits.** One reason could be that at-home HIV testing was more essential for youth during quarantine.
- MyChoices had a substantial impact among people having condomless sex.** People who used MyChoices were 6 times more likely to get an HIV test. This effect was not seen among those not having condomless sex.

While people using MyChoices or LYNX showed high rates of starting PrEP, there wasn't a meaningful difference across all points of the study. However, researchers found that:

- Participants using MyChoices reported higher confidence about starting PrEP.** There was no impact on other factors that affect PrEP use.
- People had many reasons for not starting PrEP during the study**, including not seeing a need (47%), costs (31%), and side effects (32%).

## HIV Testing & PrEP Initiation Rates among Participants by Study Condition (n=380)



## How did participants use the LYNX and MyChoices apps?

When examining users' app data across a 6-month period, we found that **the average person logged into the app a total of 11 times and spent around 33 total minutes in the app, with about 4 minutes per session.** While some people used the apps a lot more, this means that the average person was logging in about twice a month throughout the study period.

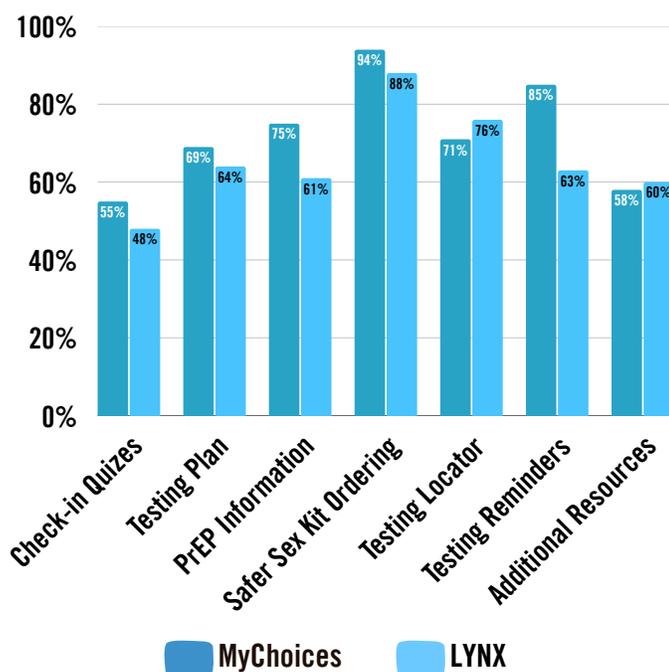
Notably, participants who used the app more did not see an increase in HIV testing or PrEP use, suggesting that the content and features might have been more impactful than simply spending more time in the app.

When surveyed about how they felt about specific features they tried out, the HIV/STI at-home testing kit and safer sex supplies ordering feature had the highest rating, followed by the testing locator and PrEP information resource on average. Across both apps, the least popular feature was the check-in quiz.

### Top Used Features

-  PrEP Information
-  Check-in Quizzes
-  Testing & Safer Sex Kit Ordering

### Proportion of Participants Rating Features as "Very Helpful" or "Extremely Helpful" (n=232)



## Key Takeaways

Overall, both apps had a positive impact on HIV testing, but only the MyChoices app showed a meaningful difference compared to routine care. Conversely, neither app had a major impact on PrEP use.

**The COMPARE study had several strengths**, including (1) community-engaged app design, (2) participant diversity, and (3) a thorough approach to the study process and analysis. **However, some factors could've affected how well the interventions worked:**

- COVID-19 impacted enrollment
- Bias from self-reporting HIV testing and PrEP use
- Free access to at-home HIV tests

### Exploring MyChoices for Wide-scale Use

People using MyChoices saw a 25% increase in HIV testing, which is like what we see among evidence-based programs promoted by the CDC. MyChoices, and other apps like it, could potentially reduce HIV in entire communities. Nearly 1 in 2 new cases of HIV are linked to people who did not know their HIV status.

### Increasing Digital Access to HIV Prevention

Participants enrolled during COVID-19 quarantine showed high interest in HIV self-testing and safer sex kits. Whether living in rural areas, traveling, or in another quarantine, app-based interventions can make accessing services convenient for youth facing isolation.

### Improving Support for PrEP

Compared to HIV testing, youth often face more barriers when trying to access PrEP, such as costs or making appointments. Future apps should have more features to address these concerns. They should also incorporate new options for PrEP that were not available at the time of the COMPARE study, such as long-acting injectables.

# Can we factor in relationships into HIV prevention among young men?

Primary finding results for ATN 157: We Prevent  
Led by Kristi Gamarel, PhD (University of Michigan)



**It is very important that young people can discuss HIV prevention in their intimate and close relationships, just like everyone else.**

Intimate and close relationships are an important part of people's lives. A key aspect of relationships is openly communicating about personal preferences and sexual desires, which also means setting clear boundaries for safer sex practices. This is especially true for young men, who may be entering their first relationships.

**Using couples-based HIV testing & counseling to bring relationship talk into HIV prevention.**

Couples-based HIV Testing and Counseling (CHTC) supports partners in navigating conversations around their sexual health. CHTC structures a space for partners to learn and practice relationship skills, like conflict navigation and communication.

CHTC aims to support how couples talk about sexual agreements, or what sex looks like in and out of the relationship, which can include things like:

- Being polyamorous, open, or monogamous,
- Types of sex allowed, and
- HIV prevention methods used.

Research has shown that sexual agreements may be highly effective at reducing the chance of HIV transmission between partners, while also improving their health and wellbeing.

**There are many HIV prevention interventions but few of these programs specifically focus on young sexual minority men in intimate relationships.**

## How was We Prevent developed?

In 2017, researchers developed the We Prevent intervention with the guidance of experts and youth stakeholders to make sure that content would meet young men's needs more appropriately. With their feedback, We Prevent was designed to be a 1-on-1 intervention with a counselor over video conferencing, either with a partner or individually.

**This study aimed to see how young sexual minority men in relationships responded to We Prevent program versus standard HIV counseling.** More specifically, they wanted to know if We Prevent could:

- Reduce rates of sexual HIV transmission
- Encourage formation of sexual agreements, and
- Be a positive experience for young men.

## We Prevent Study Process

The following describes the process for people who got the We Prevent intervention:



Mailed at-home HIV self-testing kit



Video conferenced with counselor to take HIV self-test



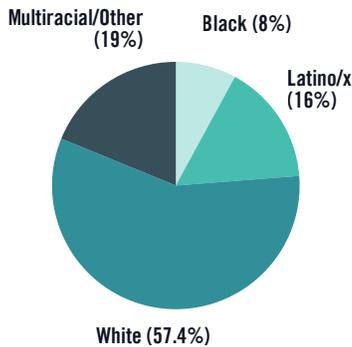
While waiting for results, counselors talked about topics like:

- Communication strategies
- Sexual agreements
- Strengths & challenges of current relationship(s)
- Differences in past & present relationships

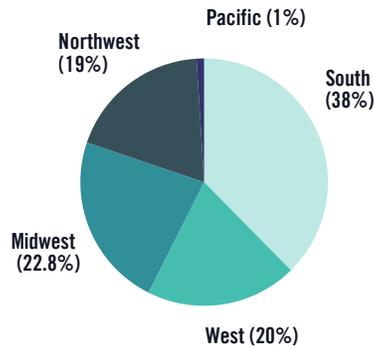
## Who participated in We Prevent?

From December 2019 to September 2020, the study team recruited 318 young sexual minority men in relationships through advertisement on social networks like Facebook and Instagram, in addition to referrals from the Annual American Men's Internet Survey.

### Racial Identity



### Geographic Region



All of the participants were in relationships at the start of the study.

**43%** were in a relationship for more than a year

**27%** did not have sexual agreements

**84%** were taking a form of PrEP when they enrolled

**61%** regularly got an HIV test every 6 months

## Most young men who received We Prevent counseling enjoyed it.

**93%**

were very satisfied with We Prevent

**82%**

would recommend it to a friend

When interviewed about their experiences with the intervention, people described We Prevent as innovative and positive. Participants also mentioned:

- Liking having neutral third party
- Learning new relationship skills, and
- Wanting more content, such as navigating sex on dating apps.

However, only about half of participants actually finished We Prevent counseling due to confusion caused by participation in similar online studies, little personal contact, and barriers related to the COVID-19 pandemic that made participating difficult.

## Participant Testimonies

“It felt good, especially at the time I was having some issues. I could have gone to my friends with that but that kind of sets a wedge in the relationship and they might view [my partner] negatively. (*Latinx cis man, 23*)”

“I learned that setting boundaries about sex is important. Setting those boundaries and clear communication is so important. (*Multiracial cis man, 20*)”

“I ended up moving out of our school housing and in with my parents and I [...] remember it just like, wanting to do this session and feeling awkward about having this HIV test kit coming to my parents' house because then they're going to be like, 'Well, why do you need to be HIV tested? What's going on?' (*White cis man, 24*)”

## What did researchers find out?

Among young men who received We Prevent counseling, researchers found that:

- 1 Participants who took part in the We Prevent program reported having **less condomless sex after nine months** compared to those who only received the standard HIV testing.
- 2 Further findings suggested that the program may be particularly effective in **helping reduce condomless sex among younger men aged 15-17 and those in long-term relationships**.
- 3 We Prevent might help **reduce intimate partner violence** for those in long-term relationships.
- 4 **The COVID-19 pandemic made it harder for participants to stay engaged**. Some said they would prefer in-person sessions for more personal interactions and emphasized the need for clearer instructions.

Because of the low number of participants who completed the intervention session, the results should be interpreted with caution. Without more data from participants completing the intervention as intended, it is difficult to attribute any differences in behavior or attitudes to the intervention or just chance.

## Key Takeaways

### Supporting Relationship Skills

Programs for young sexual minority men that include relationship skills, sexual communication, and boundary setting are crucial for HIV prevention efforts.

### Testing in Community Settings

The results of this study suggest that the We Prevent program should be evaluated in community settings to see how well it works and how doable it is for everyone involved, including clients, counselors, and other staff.

### Being Flexible is Important

We Prevent was first created for couples to do together. However, after hearing feedback from young men, the program was changed so participants could choose to do it alone or with their partner. Our study shows how important it is to listen to young people and be flexible to meet their needs.



# How can we use technology to support the sexual health of gender diverse youth?

Primary finding results for ATN 160: TechStep  
Cathy Reback, PhD (Friends Research Institute)  
Keith Horvath, PhD (San Diego State University)



## Trans youth are often less engaged in healthcare due to experiences or challenges with discrimination, stigma, and policies rooted in transphobia.

This is not only true when it comes to accessing gender-affirming care, but also HIV prevention. Trans and gender expansive (TGE) youth have a higher chance of HIV transmission than their cisgender peers, yet uptake of prevention methods like PrEP remain low.

## TGE youth cite mobile phones as a critical tool for finding health information, representing a chance to design mobile health (mHealth) tools where they can:

- Seek out trans-specific health information,
- Adopt and express new and different identities,
- Talk to other TGE youth, and
- Seek out resources.

This opportunity is especially salient considering the lack of mHealth tools developed and tested to support the sexual health of TGE youth.

## The TechStep study developed and tested different digital strategies to support HIV prevention for TGE youth.

More specifically, TechStep sought to compare how two digital interventions (text message or webapp) in combination with eCoaching could ultimately help reduce behaviors associated with HIV acquisition (like condomless anal sex) in addition to promoting PrEP use. To inform the design and content of the intervention, researchers conducted focus groups and individual interviews with TGE youth.

Between October 2019 to September 2021, 254 TGE adolescents and young adults were enrolled through online ads, referrals, and in-person outreach at sites in 5 US states. Eligibility criteria were as follows:

- 15-24 years old,
- Identifying as TGE,
- Confirmed as HIV negative, and
- Reported recent penetrative sexual activity

## Participant Demographics at Baseline

### Over half of participants identified as nonbinary, with the remaining

♂  
**34%**

identifying as trans men

♀  
**7%**

identifying as trans women

Compared to nonbinary participants, trans men and trans women were more likely to have used hormones.

### Just under half of people had condomless sex in the past 3 months, with

🧠  
**90%**

having heard of PrEP

💊  
**15%**

having ever used PrEP in the past

In addition, only about 2 in 10 had conversations about PrEP with their provider prior to the study.

### Other demographics include:

- Two-thirds of participants were 21 years or older
- Just over half of participants identified as White
- The majority lived in their own apartment or house
- 90% had used alcohol or cannabis in their lives

After enrolling, participants were randomly assigned to receive one of the three following interventions:

- 1 **Daily text messaging** with education and tips for engaging in safer sex behaviors
- 2 **Webapp** with education, health trackers, and peer-to-peer forums
- 3 **Static, information-only website** that served as the “control” condition

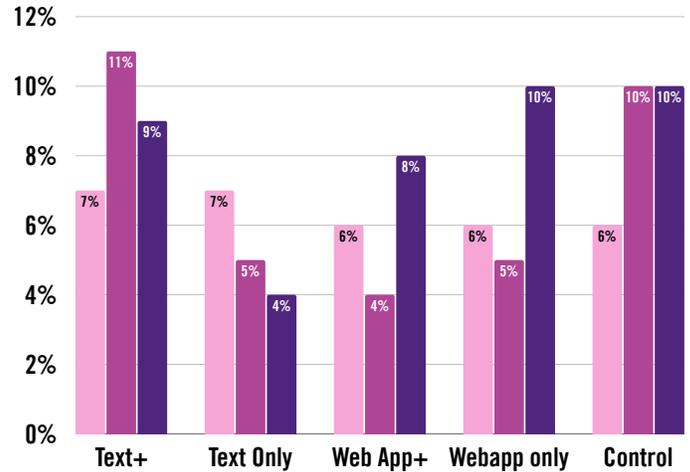
At the three month mark, participants who did not show improvements regarding safer sex behaviors or PrEP use had a random chance of being “stepped-up” to receive virtual eCoaching in addition to their original intervention. We call these groups Text+ and Webapp+. eCoaching consisted of up to 8 weekly sessions to offer tailored education and support via Zoom.

**42%**  
of people were stepped-up to get eCoaching

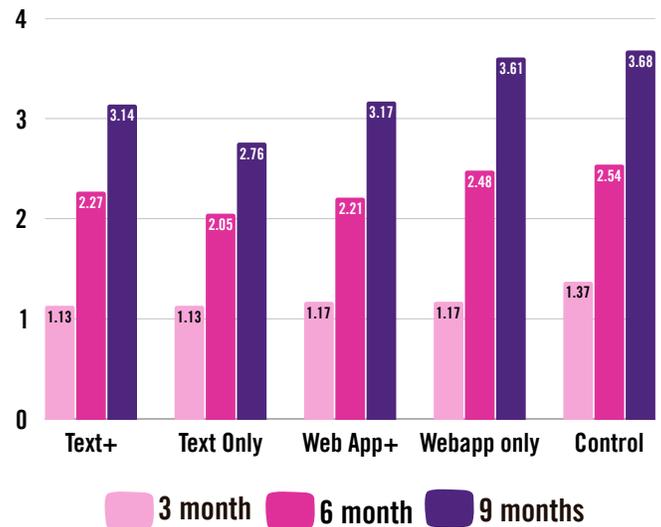
**A stepped-care approach is unique because it recognizes that people sometimes need an extra “nudge.”**

Rather than assuming that every person needs a lot of support from the start, a stepped-care model increases the intensity of an intervention over time if a person is struggling to adopt a behavior, either because of individual or environmental challenges. This approach can also help save agencies resources.

**Proportion of Participants Taking PrEP Over 9 Months by Intervention Group (n=254)**



**Condomless Encounters Over 9 Months by Intervention Group (n=254)**



## Examples of TechStep Features

### WebApp Design

In addition to tools like hormone or PrEP medication trackers, the Webapp also offered features like content warnings for posts, profile avatars by trans artists, and community walls where users could speak their minds with peers.

### Text Messages

Participants received regular one-way messages like:

- “Trans Pride is taking care of yourself.”
- “Nothing compares to you, you can be safe.”
- “Keeping your doctor’s appointments? Keep up the good work!”



## Researchers followed participants for 9 months and found mixed impact on condom and PrEP use.

While no intervention condition was superior overall to the information-only control condition, researchers found several trends at specific points of the studies:

- 1 Participants who only received texts showed a reduction in condomless sex** at the six and nine month mark. This impact was not seen among Text+ (with coaching). One explanation is that the extra coaching interaction may have interfered with the text messages' impact.
- 2 The Webapp+ (with coaching) group saw a reduction in condomless sex overall.** This was not seen in the Webapp-only group, potentially because being stepped up encouraged users to revisit and explore the webapp.
- 3 No single intervention had a significant impact on PrEP uptake.** However, PrEP uptake across the study was lower than expected, making it difficult to attribute differences with certainty.

Because of the high number of participants who were non-Hispanic White and trans masculine, the results should be interpreted with caution as they might not represent the entire spectrum of TGE youth or those who have the highest prevention needs. In addition, the COVID-19 pandemic impacted the original plan to conduct and analyze STI testing.

## Key Takeaways

Select components of the TechStep study showed a positive impact on reducing condomless sex; however, these approaches might not be enough to convince TGE youth that PrEP is a relevant HIV prevention option.

### Unpacking How Components Interact

TechStep offered participants exciting tools, but it was hard to tease out how these tools work together. Future research need to consider how components interact to maximize impact with the fewest resources possible.

### Narrowing the Criteria for Stepped Care

More participants were eligible to be stepped up at the three month mark than expected. Future studies might consider using stricter criteria to better balance the benefit of additional “nudges” against cost savings.

### Understanding the Diversity of TGE Youth

Overall, research on how digital interventions can benefit TGE youth is limited. TechStep represents a step forward but we still need more tailored research to capture the unique needs and experiences of a greatly diverse group.



I loved the chance to connect with other trans folks like me.

You don't see apps like this every day. We need more!

Tell 'em, sis!

## Further Readings

### ATN 138: YouThrive

- Hightow-Weidman, L. B., Horvath, K. J., Scott, H., Hill-Rorie, J., & Bauermeister, J. A. (2021). **Engaging youth in mHealth: what works and how can we be sure?** mHealth, 7, 23. <https://doi.org/10.21037/mhealth-20-48>
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- Muessig, K. E., LeGrand, S., Horvath, K. J., Bauermeister, J. A., & Hightow-Weidman, L. B. (2017). **Recent mobile health interventions to support medication adherence among HIV-positive MSM.** Current opinion in HIV and AIDS, 12(5), 432–441. <https://doi.org/10.1097/COH.0000000000000401>
- Horvath, K. J., Lammert, S., LeGrand, S., Muessig, K. E., & Bauermeister, J. A. (2017). **Using technology to assess and intervene with illicit drug-using persons at risk for HIV.** Current opinion in HIV and AIDS, 12(5), 458–466. <https://doi.org/10.1097/COH.0000000000000398>
- Bauermeister, J. A., Golinkoff, J. M., Muessig, K. E., Horvath, K. J., & Hightow-Weidman, L. B. (2017). **Addressing engagement in technology-based behavioural HIV interventions through paradata metrics.** Current opinion in HIV and AIDS, 12(5), 442–446. <https://doi.org/10.1097/COH.0000000000000396>

### ATN 139: Get Connected

- Bauermeister, J. A., Pingel, E. S., Jadwin-Cakmak, L., et al. (2015). **Acceptability and preliminary efficacy of a tailored online HIV/STI testing intervention for young men who have sex with men: the Get Connected! program.** AIDS and behavior, 19(10), 1860–1874. <https://doi.org/10.1007/s10461-015-1009-y>
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- Bauermeister, J. A., Golinkoff, J. M., Horvath, K. J., et al. (2018). **A Multilevel Tailored Web App-Based Intervention for Linking Young Men Who Have Sex With Men to Quality Care (Get Connected): Protocol for a Randomized Controlled Trial.** JMIR research protocols, 7(8), e10444. <https://doi.org/10.2196/10444>
- Bauermeister, J. A., Golinkoff, J. M., Lin, W. Y., et al. (2019). **Testing the Testers: Are Young Men Who Have Sex With Men Receiving Adequate HIV Testing and Counseling Services?** Journal of acquired immune deficiency syndromes (1999), 82 Suppl 2(2), S133–S141. <https://doi.org/10.1097/QAI.00000000000002173>
- Bauermeister, J. A., Horvath, K. J., Lin, W. Y., et al. (2024). **Enhancing routine HIV and STI testing among young men who have sex with men: primary outcomes of the get connected clinical randomized trial** (ATN 139). BMC public health, 24(1), 1072. <https://doi.org/10.1186/s12889-024-18522-w>

## Further Readings

### ATN 142: PrEPared, Protected, emPowered (P3)

- Hightow-Weidman, L. B., Horvath, K. J., Scott, H., Hill-Rorie, J., & Bauermeister, J. A. (2021). **Engaging youth in mHealth: what works and how can we be sure?**. *mHealth*, 7, 23. <https://doi.org/10.21037/mhealth-20-48>
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- Horvath, K. J., Lammert, S., LeGrand, S., Muessig, K. E., & Bauermeister, J. A. (2017). **Using technology to assess and intervene with illicit drug-using persons at risk for HIV.** *Current opinion in HIV and AIDS*, 12(5), 458–466. <https://doi.org/10.1097/COH.0000000000000398>
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### ATN 143: COMPARE

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- Giovenco, D., Muessig, K. E., Horvitz, C., Biello, K. B., Liu, A. Y., Horvath, K. J., Golinkoff, J. M., Reback, et al. (2021). **Adapting technology-based HIV prevention and care interventions for youth: lessons learned across five U.S. Adolescent Trials Network studies.** *mHealth*, 7, 21. <https://doi.org/10.21037/mhealth-20-43>
- Biello, K.B., Marrow, E., Mimiaga, M.J., Sullivan P., Hightow-Weidman, L., & Mayer, K.H. (2019). **A Mobile-Based App (MyChoices) to Increase Uptake of HIV Testing and Pre-Exposure Prophylaxis by Young Men Who Have Sex With Men: Protocol for a Pilot Randomized Controlled Trial.** *JMIR Research Protocols*, 8(1). <https://doi.org/10.2196/10694>
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### ATN 157: We Prevent

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- Chavanduka, T.M.D., Rosso, M.T. et al. (2021) **Sex in the Time of COVID-19: Results of an Online Survey of Gay, Bisexual and Other Men Who Have Sex with Men’s Experience of Sex and HIV Prevention During the US COVID-19 Epidemic**. AIDS Behav 25, 40–48. <https://doi.org/10.1007/s10461-020-03024-8>
- Gamarel, K. E., Stephenson, R., & Hightow-Weidman, L. (2021). **Technology-driven methodologies to collect qualitative data among youth to inform HIV prevention and care interventions**. mHealth, 7, 34. <https://doi.org/10.21037/mhealth-2020-5>

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- Zlotorzynska, M., Bauermeister, J. A., Golinkoff, J. M., Lin, W., Sanchez, T. H., & Hightow-Weidman, L. (2021). **Online recruitment of youth for mHealth studies**. mHealth, 7, 27. <https://doi.org/10.21037/mhealth-20-64>
- Reback, C.J., Rusow, J.A., Cain, D., Benkeser, D., Arayasirikul, S., et al. (2020). **Technology-Based Stepped Care to Stem Transgender Adolescent Risk Transmission: Protocol for a Randomized Controlled Trial (TechStep)**. JMIR Research Protocols, 9, 8. <https://doi.org/10.2196/18326>