

MEETING AGENDA

Wednesday, July 24, 2019
2:30 p.m. – 4:30 p.m.

Call to Order

Welcome/Introductions

Approval of Agenda

Approval of Minutes

Report of Co-Chairs

Report of Staff

Prevention Services Initiatives:

- Update on New HIV Diagnoses among People Who Inject Drugs (PWID) – *Caitlin Conyngham, AACO*
- Demonstrating Expanded Interventional Surveillance: Towards Ending the HIV Epidemic in Philadelphia (DExIS) – *Akash Desai, AACO*

Discussion Items:

- Strategies for Engaging Youth
- PrEP Workgroup Report
 - Next Steps
- Ending the HIV Epidemic

Old Business

New Business

Announcements

Please contact the office at least 5 days in advance if you require special assistance.

The next Prevention Committee meeting will be held on
Wednesday, August 28, 2019 from 2:30 - 4:30 p.m. at the
Office of HIV Planning, 340 N. 12TH Street, Suite 320, Philadelphia, PA 19107
(215) 574-6760 • FAX (215) 574-6761 • www.hivphilly.org

PREVENTION COMMITTEE

Philadelphia HIV Integrated Planning Council

Prevention Committee

Meeting Minutes of

Wednesday, June 26, 2019

2:30 p.m. – 4:30 p.m.

Office of HIV Planning, 340 N. 12th Street, Suite 320, Philadelphia PA, 19107

Present: Clint Steib, Dave Gana, Erica Rand, Gus Grannan, Janice Horan, Joseph Roderick, Keith Carter, Lupe Diaz, Mark Coleman

Absent: Katelyn Baron, Nhakia Outland, Zora Wesley

Excused: Eran Sargent, Loretta Matus

Guests: Beth Gotti

Staff: Briana Morgan, Sofia Moletteri

Call to Order:

C. Steib called the meeting to order at 2:34pm.

Welcome/Introductions:

Everyone introduced themselves. C. Steib mentioned that L. Matus would not be able to make the meeting.

Approval of Agenda:

C. Steib called for a motion to approve the agenda. **Motion: M. Coleman moved, D. Gana seconded to approve the agenda. Motion passed by general consensus.**

Approval of Minutes:

C Steib called for a motion to approve the meeting minutes from May 22, 2019. **Motion: D. Gana moved, J. Roderick seconded to approve the minutes. Motion passed by general consensus.**

Report of Co-Chairs:

C. Steib mentioned that there was not much to report on at the time except that he and L. Diaz would be going to Baltimore for the UCHAPS meeting.

Report of Staff:

B. Morgan said all important reports would be covered under the discussion items. B. Morgan also reported recent news about Hahnemann Hospital closing—she warned everyone to watch out for that impact, adding that there was not too much information on its closing at the moment. Regarding the

hospital, C. Steib noted the definite concern around perinatal transmissions. L. Diaz asked if Hahnemann has an HIV unit. C. Steib answered, saying that the hospital has Drexel Partnership Clinic. He said there would be more information about Hahnemann to come. B. Morgan mentioned how there are currently only six labor and delivery hospital options in Philadelphia.

Prevention Services Initiatives:

C. Steib tabled this conversation on account of C. Conyngham's (AACO) absence.

Discussion Items:

— PrEP Workgroup Report —

Planning Council Discussion & First Steps

B. Morgan stated that the Planning Council felt as if it did not have enough information or context to vote on the PrEP Workgroup Report. B. Morgan asked for the committee's input in order to gauge how the Planning Council should proceed and how the report should be presented for review in July. C. Steib asked for clarification about the report's initial presentation. G. Grannan answered, letting the committee know that the Planning Council went through each individual point one by one, but this method did not catch anybody's attention. C. Steib then asked if the council had known there was a PrEP workgroup. B. Morgan mentioned that it had been announced in the past, but people outside of Prevention Committee have not had as much interaction—or possibly any—with the PrEP workgroup.

B. Morgan asked what the committee's intention is for the report. B. Morgan presented the following questions to the committee: should the report be in the appendix? Should items from the report be picked up, and should Planning Council run with them? Is this report something that should result in immediate action? E. Rand and L. Diaz said that the lengthy initial Planning Council discussion around the report caused people to zone out. L. Diaz noted that the setup of the tables was conducive to socialization and wavering attention, not discussion. E. Rand suggested that next month, July 2019, if there is more time to re-present the PrEP report, it might be better received. K. Carter recommended sending another email to the Planning Council body asking for a robust discussion around the report. K. Carter also mentioned the use of "hot button" terms and key topics/discussion points in the email for simplification purposes and more palatable information for the council. L. Diaz played off of K. Carter's point, saying that they would tell Planning Council that Prevention Committee will be asking questions about the document based on the discussion points. B. Morgan reiterated that Planning Council needed to vote on the document, and there needed to be a basic understanding of the document to do so. She said picking out certain ideas like L. Diaz and K. Carter suggested could work.

G. Grannan said the easiest way would be to attach this to the plan as an appendix, and when issues come up, one can just refer to the PrEP Addendum. G. Grannan said instead of integrating it directly

into the plan, the appendix idea would be more honest to the report's development since it was not initially written with the plan.

B. Morgan stated that the PrEP report is not really a plan, it is a report tied to an existing plan. In this sense, it is not exactly stand-alone. She stated that the appendix notion had been suggested to Planning Council. She continued that next year, if the Planning Council wanted, it would be a good time to incorporate key elements of the PrEP report to the update of the plan. C. Steib agreed with this idea because the update is happening next year anyways. The committee seemed to all agree. C. Steib explained the Council needed to vote on the report now.

K. Carter questioned the release of the updated plan. B. Morgan said OHP is going to work on that for 2020. B. Morgan pointed out that this could be put as an appendix right away, and they could work on the incorporation with the 2020 plan update. D. Gana suggested that Prevention Committee present an overview of everything so people have an understanding of what they are voting on. He voiced his concern about how people have and will abstain from voting on PrEP report because they don't understand it.

C. Steib clarified that the committee wants the report as an appendix, and later, it should be integrated into the 2020 plan. He asked B. Morgan to give more time to the report in the meeting and put it at the beginning of the agenda so people do not burn out. Regarding the email about PrEP to the whole council, C. Steib echoed the idea of having goals and objectives and how they relate to key elements or points for discussion. B. Morgan suggested drafting the email for Planning Council and first sending it to the committee for approval. Everyone agreed that this would be a good idea.

— **End the Epidemic Initiative (EEI)** —

B. Morgan said that there is a bit more information coming out about the End the Epidemic Initiative. She informed the group about NOFOs (notice of funding opportunity), the new FOA. She mentioned that the CDC just released a first NOFO about EEI. Most webinars have not been updated so there are still speculative plans in place. B. Morgan explained that the EEI will rely heavily on Federally Qualified Health Centers (FQHCs) and FQHC lookalikes for PrEP rollout and HIV testing. These FQHCs see 25 million patients a year but only do 2 million HIV tests a year. B. Morgan continued, saying that OHP has been adding the FQHCs to the service directory. B. Morgan then voiced her concern about there being no FQHCs or lookalikes in Bucks county. B. Morgan mentioned C. Terrell's informative presentation on the EEI at the last Planning Council meeting. She then stated that the first NOFO the CDC released, due July 12th, is around strategy, building, and partnerships. She said that it is trying to identify who is going to do what. B. Morgan then explained that when the EEI money is released, the CDC wants a rapid turnaround (approximately a couple of months). She explained that there is nothing to do to prepare, but the Planning Council should brace itself.

C. Steib mentioned a webinar he participated in regarding EEI. He said he printed out the four pillars—Treatment, Respond, Diagnose, and Prevent—and their accompanying questions. C. Steib

read the committee the Treatment Pillar questions. **Refer to HRSA HAB Recipient Webcast handout under the subheading, Treatment Pillar** B. Morgan responded that she knows that the Treatment Pillar is planning on relying heavily on technical assistance. B. Morgan explained that the AETC (AIDS Education Training Centers) can rely more heavily on technical assistance than Ryan White, because Ryan White is only allowed to work with people who are HIV positive. Therefore, the Prevention Pillar is really depending on the AETC. K. Carter mentioned the 15-09 and said that data can be collected from the newly diagnosed. B. Morgan said this 15-09 is prevention. She also stated that if people are not in the care system, it is the job of the prevention provider to get them care. B. Morgan acknowledge reasons people might not get linked to care, e.g. sometimes people don't want to be linked to care or have difficulty getting an appointment. B. Morgan reminded the group that there are some things that the Planning Council cannot help, but there are always the things that happen often enough that the council can do something about. For example, B. Morgan stated that this might look like building organizational capabilities and helping them do better. G. Grannan suggested that technical assistance could even be used to stop misgendering at-risk groups. He further explained that approaches of the like would really help retention in care.

The group moved onto the third question under the Treatment Pillar: what new partners do you plan to engage? B. Morgan explained that for EEI, when it comes to partnerships, Planning Council and OHP are interested in partnerships and involving people more on the council. She explained how a meeting and a phone call is always very helpful for the OHP, and there is always a standing invitation for council members to introduce the OHP to their connections. B. Morgan emphasized the importance of having people from different areas of expertise.

B. Morgan returned and let the committee know that the current CDC NOFO being responded to is for 47 counties and 7 states that are responsible for 50% of new HIV infections. She explained that most counties, except for one, are located in EMA. B. Morgan continued, saying that in Philadelphia, the plan and funding will be geared towards Philadelphia. However, when it comes to partnerships, B. Morgan explained that the office is going to look at how that impacts the whole EMA as well. She explained that technically, the EEI is only going to be for Philadelphia, but the office is going to try do what they can. M. Coleman asked if Philadelphia is doing well, comparatively. B. Morgan responded that through Ryan White, yes, Philadelphia is doing well. However, B. Morgan continued, some people either don't know about Ryan White or just don't access it. She acknowledged the improvements, but there is definitely not a lot of room for more improvement since its success rate is already pretty high.

K. Carter asked about the prevention portion of the EEI and whether the Prevention Committee will need to come up with plan or take on some responsibility. B. Morgan said that as of right now, there is no responsibility for EEI, but there will most likely be involvement with EEI and the council once it hits the ground. B. Morgan expressed that the committees will be asked to help out eventually and that talking and having discussions about the EEI will be very helpful so that everyone can be prepared.

Refer to HRSA HAB Recipient Webcast. C. Steib suggested that each of these questions can be discussions for the group. E. Rand asked what their reach is, because people who have access to AETC are usually already involved. C. Steib recommended reaching out to AETC to see if they can come to Planning Council to talk more on this topic. E. Rand continued, saying that the target population would be those who don't know about webinars, because these are the people who actually need the information. C. Steib said to check out the AETC website to look at a list of webinars. B. Morgan said there are many webinars from many different sources, so she might work on compiling something for people to look at.

B. Morgan directed the conversation back to technical assistance, asking if there is anything that nobody knows or hasn't been able to find. E. Rand asked if the committee is answering this for Planning Council or city. B. Morgan responded that she just wants a perspective, but the committee is not responsible in regards to the city. B. Morgan said that there are 4 presentations the committee was planning on getting. She continued to mention one particular presentation, DEXIS, a molecular surveillance initiative for which the city received funding. There is someone from DEXIS who OHP wanted at a meeting to talk to the Prevention Committee. C. Steib informed everyone that there was a briefing about this in the past, and there are two groups—support staff and providers. He explained that these two groups were teamed up from the same agency, so they could work closely together. C. Steib informed the committee that in the first meeting for DEXIS, he was told there are going to be in-depth case studies about newly identified positive folks. DEXIS was planning on going deeply into gaps of care in newly identified people's charts to find missed opportunities. Based on that, they would try to put intervention in place for this. C. Steib said this DEXIS group was all 13-24 youth and, for the most part, MSM of color and trans individuals. B. Morgan mentioned how C. Conyngham will probably email about the DEXIS discussion soon.

B. Morgan said that in the EEI, there will be syringe service support, and this is particularly important to consider from EMA perspective, not just Philadelphia. She further explained that there is a serious lack of syringe service access in the rest of the EMA. B. Morgan expressed how Planning Council needs to figure out how to support this without paying for syringes themselves. She mentioned that for Ryan White funds, the council is able to support these services for people who are already positive.

K. Carter asked who will pay for these syringe services. D. Gana responded with the city, but not Ryan White. B. Morgan said that they are able to pay for syringe services with Ryan White, just not the actual syringes. G. Grannan asked about syringe disposal and whether that would be paid for. B. Morgan said she has not seen anything that would indicate that it could not be paid for. L. Diaz said since used syringes are a biohazard, the disposal portion can be expensive. K. Carter said that there are places to go where people can drop them off. B. Morgan mentioned that in massive amounts there is no place to dispose of them. G. Grannan said that organizations will refuse to dispose of syringes because of insurance reasons. The group asked about Prevention Point, and G. Grannan clarified that Prevention Point is an exchange, so someone would have to bring syringes back since there is a (very expensive) disposal process.

The idea of this EEI, said B. Morgan, is to go after things that *you can do*, because even if there is resistance in a lot of places, there is always room to do something and make a difference. G. Grannan asked if individuals are actually going to medical examiners to see if they can find disease rates among those confirmed overdoses. B. Morgan said she was uncertain. The group seemed to agree that this would be valuable information. K. Carter asked about confirmed overdose rates. G. Grannan said it was about 1,200 in 2017 and 1,100 in 2018, explaining that rates have been increasing since 2013. From C. Terrell's presentation, B. Morgan said that for new HIV diagnoses, the increase was 33% in 2016, 45% in 2017, and 59% in 2018. G. Grannan mentioned that prior to these statistics, new cases in PWID was between 3-5% for 20 years of decline. K. Carter asked about injection drug use and the specific drugs in question. G. Grannan and B. Morgan responded that it could be anything, and the rate for Hepatitis C cases has also gone up for PWID.

C. Steib asked if everyone wanted to move on and commented on the productivity of the committee's discussion. B. Morgan expressed the importance of in-depth conversation about such issues.

Old business:

None

New Business:

D. Gana mentioned Bucks County, saying there is a sex positive health clinic opening up in July which will focus on HIV testing, STIs, and PrEP and its distribution. He said the clinic will be right next to the Bucks County Board of Health since it's central in Bucks County for everyone's access. B. Morgan mentioned that in PA counties, 33% currently diagnosed already have AIDS. Based on 2016 data, B. Morgan also explained that this was the case for 17.4% of Philadelphia new diagnoses and 17.7% for New Jersey counties. She said that this percentage has gone down in Philadelphia and New Jersey counties and up in PA counties. C. Steib asked about the population most affected in the suburbs. B. Morgan responded that the population affected is fairly representative of the PA counties. D. Gana said that a lot of physicians in the county are not involved with HIV until someone actually gets sick. M. Coleman mentioned Montgomery County and the city of Norristown, asking if there is as much of a problem with injection drug use. G. Grannan responded that this is a problem all around the EMA.

Announcements:

D. Gana announced the Men's Health Conference on June 27th from 11 am-3pm at 38th and Lancaster. He explained that the free event will have HIV testing from many different organizations.

C. Steib mentioned that June 27th is also national HIV testing day. He let the committee know that many agencies will be testing at Walgreens or holding their own events. C. Steib also mentioned the Trans Health Conference in July. He told everyone to check up with the Mazzoni Center to set up a

table. D. Gana confirmed the conference dates as July 25th-27th. L. Diaz said they are still accepting tables.

M. Coleman announced to everyone that there will be a lot of events happening due to Wawa Welcome America starting June 29th and extending to July 4th.

L. Diaz announced that she and C. Steib would be going to Baltimore for the UCHAPS meeting.

Adjournment: C. Steib called for a motion to adjourn. **Motion: L. Diaz moved, G. Grannan seconded to adjourn Prevention Committee meeting. Motion passed by general consensus.**
Meeting adjourned at 4:00 PM.

Respectfully Submitted,

Sofia M. Moletteri, staff

Handouts distributed at the meeting:

- Meeting Agenda
- Meeting Minutes from May 22, 2019
- PrEP Workgroup Report
- HRSA HAB Recipient Webcast

Recommendations to increase YMSM engagement in healthcare and HIV prevention activities

Increasing access to and engagement with primary care for YMSM is essential. Engagement in primary care is an especially important tool in the HIV prevention “toolbox” in this age of biomedical interventions like pre-exposure prophylaxis and “treatment as prevention”. HIV-negative YMSM can be linked to appropriate interventions and have regular sexual health screenings. YMSM who are regularly tested and engaged in healthcare will have a better chance of being linked to HIV care and treatment, should they acquire HIV. Programs that engage YMSM in healthcare should address their complex needs, including mental health, substance use, chronic health conditions, and social needs, in developmentally appropriate ways.

A combination of routine testing in all primary care settings and targeted community-based testing is necessary. Risk-based testing alone may miss high-risk individuals who are reluctant to disclose same-sex attraction and/or their sexual behaviors or substance use.

Comprehensive evidence-based sexual health education, inclusive of all gender identities and sexual orientations, is needed in the Philadelphia school district. Young people need sexual health education that promotes not only their health but their well-being.

HIV testing protocols should address concerns about confidentiality. HIV testing programs ought to consider who provides the counselling and testing, where testing occurs, and how to address concerns about confidentiality and privacy. It may be beneficial to include information about privacy protections and confidential testing protocols in outreach and marketing materials, in order to address those concerns before they can become barriers to testing.

Special attention should be paid to creating welcoming and accepting organizational cultures. Healthcare organizations need to prioritize the barriers, challenges and concerns of YMSM. YMSM want to go to providers who can relate to their experiences and accept them as they are.

Relevant information about local services, sexual health, and HIV/STD testing should be online in the places YMSM are likely to find it. Reliable online content will help many YMSM, especially those who are reluctant or unable to access services in the “gay” community. More local research is needed to better understand how Philadelphia’s youth access online health information.

Community level efforts are needed to address HIV stigma and discrimination of LGBTQ individuals, which persist and act as a barrier to open communication about the sexual health needs of YMSM.

Public health programs and healthcare organizations must be sensitive to the effects of stigma and discrimination on YMSM; especially minority YMSM who face not only stigma because of their sexuality and/or gender expression, but also live in a society with pervasive structural racism.

An excerpt from **Experiences in Healthcare and HIV testing in Philadelphia: Young men who have sex with men.** The full report can be found at <http://hivphilly.org/reports/YMSM.pdf>

April 2015



Published in final edited form as:

AIDS Care. 2014 January ; 26(1): . doi:10.1080/09540121.2013.808730.

Linking HIV-positive adolescents to care in 15 different clinics across the United States: Creating solutions to address structural barriers for linkage to care

Morgan M. Philbin^{a,*}, Amanda E. Tanner^b, Anna DuVal^c, Jonathan Ellen^c, Bill Kapogiannis^d, and J. Dennis Fortenberry^e

^aDepartment of Health, Behavior & Society, Johns Hopkins School of Public Health, Baltimore, MD, USA

^bDepartment Public Health Education, University of North Carolina Greensboro, Greensboro, NC, USA

^cDepartment of Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD, USA

^dDepartment of Health and Human Services, National Institute Health, Bethesda, MD, USA

^eDepartment of Pediatrics, Indiana University School of Medicine, Indianapolis, IN, USA

Abstract

Linkage to care is a critical corollary to expanded HIV testing, but many adolescents are not successfully linked to care, in part due to fragmented care systems. Through a collaboration of the National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC) and the Adolescent Trials Network (ATN), a linkage to care outreach worker was provided to ATN clinics. Factors related to linkage were explored to better understand how to improve retention rates and health outcomes for HIV-positive adolescents. We conducted 124 interviews with staff at 15 Adolescent Trials Network clinics to better understand linkage to care processes, barriers, and facilitators. Content analysis was conducted focusing on structural barriers to care and potential solutions, specifically at the macro-, meso-, and micro-levels. Macro-level barriers included navigating health insurance policies, transportation to appointments, and ease of collecting and sharing client-level contact information between testing agencies, local health departments and clinics; meso-level barriers included lack of youth friendliness within clinic space and staff, and duplication of linkage services; micro-level barriers included adolescents' readiness for care and adolescent developmental capacity. Staff initiated solutions included providing transportation for appointments and funding clinic visits and tests with a range of grants and clinic funds while waiting for insurance approval. However, such solutions were often ad hoc and partial, using micro-level solutions to address macro-level barriers. Comprehensive initiatives to improve linkage to care are needed to address barriers to HIV-care for adolescents, whose unique

© 2013 Taylor & Francis

*Corresponding author. mphilbin@jhsph.edu.

Publisher's Disclaimer: Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

developmental needs make accessing care particularly challenging. Matching the level of structural solution to the level of structural barriers (i.e., macro-level with macro-level), such as creating policy to address needed youth healthcare entitlements versus covering uninsured patients with clinic funds is imperative to achieving the goal of increasing linkage to care rates for newly diagnosed adolescents.

Keywords

adolescents; HIV/AIDS; linkage to care; structural barriers; qualitative methods

Introduction

Linkage to care (LTC) for newly diagnosed HIV-positive adolescents is an important consideration as the United States HIV epidemic shifts toward younger individuals; an estimated 26% of HIV infections occur among youth ages 13–24 (Centers for Disease Control and Prevention [CDC], 2013). Over 100,000 adolescents (13–24) are currently infected with HIV (CDC, 2013). Younger age is associated with lower rates of retention in care during the first two years following diagnosis (Ulett et al., 2009), and HIV-diagnosed persons under 35 years of age have more difficulty establishing, and being retained in care (Giordano et al., 2005). In general, not being engaged in care or having inconsistent medical visits is associated with higher mortality (Giordano et al., 2007; Metsch et al., 2008; Tripathi, Youmans, Gibson, & Duffus, 2011).

Barriers to care have individual and structural roots. Most LTC interventions have focused on the individual – e.g., strengths-based LTC and case management – with varying levels of success (Craw et al., 2010; Craw et al., 2008; Gardner et al., 2009). Less attention, however, has been given to “structural barriers” – factors impeding HIV-related care that originate in the social, economic and political disparities that shape and constrain individual health behaviors (Blankenship, Bray, & Merson, 2000). Structural barriers include HIV-related stigma and poverty (Cunningham et al., 1999; Kempf et al., 2010; McCoy, 2002), housing availability and homelessness (Gardner et al., 2009), unemployment or job instability (Stein et al., 2000), insurance policy/eligibility (Cook et al., 2002; Lillie-Blanton et al., 2010), and public transportation options (Kempf et al., 2010).

Structural barriers are particularly relevant for HIV-positive adolescents who often have difficulty navigating fragmented care systems (Chutuape et al., 2010). This structural fragmentation can occur when HIV testing sites fail to plan for LTC, when adolescents must negotiate transitions across multiple care systems, when legal or regulatory issues require disclosure to parents, and when providers are unprepared to care for HIV-positive adolescents (Mugavero, Norton, & Saag, 2011). Adolescents may be particularly likely to receive HIV testing in community-based rather than clinic-based venues, and given the fragmentation between diagnosis and care, rates of successful LTC are lower in community-based settings compared to clinic-based settings (CDC, 2013). Relatively few HIV-related health services are specifically designed for adolescents, even though adolescents differ from adults in their ongoing dependence on families for resources, health insurance, transportation, and access to clinics and pharmacies.

Methods

Data were obtained from a multimethod evaluation of the Strategic, Multisite, Initiative for the Identification, Linkage and Engagement in Care Program (hereafter called the Care Initiative). The care initiative originated in a formal partnership of the National Institutes of

Child Health and Human Development, Centers for Disease Control & Prevention, and The Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN). The care initiative was developed to improve LTC for HIV-positive adolescents by improving collaboration with local health departments and community partners, and by supporting outreach workers solely dedicated to facilitating adolescent linkage to care (Tanner et al., in press).

The data included 124 semi-structured qualitative interviews collected between February 2010 and October 2011 from 15 ATN clinics across 13 cities in the US that provide HIV-related care to adolescents (Straub et al., 2007). Two qualitatively trained researchers conducted interviews with ATN staff involved in linkage to care processes (e.g., physicians, nurses, linkage to care outreach workers, social workers, case managers, and program staff). Interviews lasted approximately one hour each. Interviews used a topic guide that focused on site-specific organization and LTC processes; facilitators and barriers to LTC; relationships with local health departments and community partners; and the scale-up of the care initiative LTC process. Specific inquiries addressed potential solutions to barriers to LTC. Interviews were conducted in personnel offices or a private space at the clinics, and informed consent was obtained prior to each interview. Interviews were digitally recorded, transcribed verbatim, and managed using Atlas ti 6.2 (Muhr, 2004). The Institutional Review Board at the Johns Hopkins Medical Institutions and each ATN site approved the study protocol.

We used a Dynamic Social Systems model (Latkin, Weeks, Glasman, Galletly, & Albarracin, 2010) to guide the identification of structural factors associated with linkage to care, specifically the influence of macro-, meso-, and micro-level structures (Latkin et al., 2010). This model emphasizes the social and dynamic qualities of structural factors that influence HIV programs, and postulates three key structural dimensions that affect care: resources; influence and control; and, contextual factors (Latkin et al., 2010). Within the current study, the macro-level structure refers to the sociopolitical, economic, and cultural context, as well as larger social institutions that shape linkage to care more broadly. The meso-level structural factors include systems that work within the more proximal institutions, within which individuals are involved (for example, clinic dynamics and physical space). Micro-level structural factors refer to the immediate social and physical context within which interactions among individuals take place (for example, between providers and patients; Latkin et al., 2010). Pairing this model with qualitative research has allowed us to explore issues related to adolescents and linkage to care, which have been missing in earlier studies.

To assess the barriers and facilitators to linkage to care at each of the 15 ATN clinics, transcripts were analyzed using the constant comparative method (Glaser & Strauss, 1967). A list of thematic codes was first created based on the existing linkage to care literature and interview guide; two team members read and coded each interview transcript to create an initial code dictionary. These team members cross-coded a random sample of 33% of transcripts to refine the code dictionary, which was subsequently reviewed by other team members. Final coding was conducted during a sequence of weekly meetings to develop additional codes and resolve discrepancies. We constructed analytical memos on these processes, discussed the memos, and refined the coding matrix based on these discussions of the data (Glaser & Strauss, 1967). Following the procedures of the constant comparative method, we searched for negative cases to explore potential exceptions to the themes surrounding barriers and facilitators to linkage to care, modified and developed the coding matrix as needed, and returned to the data for additional comparisons (Glaser & Strauss, 1967). A random sample of 20% of the interviews was again cross-coded to assess consistency; any discrepancies in coding were discussed among the investigators and resolved.

Results

Examining linkage to care barriers and solutions

Barriers and potential solutions to LTC emerged, and fell into three general headings corresponding to the Macro-, Meso-, and Micro-level structures identified in Dynamic Social Systems model, and resembling components of other models of structural barriers for HIV-related prevention (Latkin et al., 2010). These are described briefly below; quotes describing these barriers and potential solutions are presented in Table 1.

Macro-level structural barriers and solutions—Macro-level structural barriers to linkage to care coalesced around categories of insurance availability and maintenance; transportation; and system-wide relationships between clinics, local health departments, and testing organizations. Pragmatic insurance-related barriers were associated with the application process, possession of adequate documentation, and delays related to locating documentation that many youth did not possess (See Table 1 “Resources”). Eligibility-related insurance barriers were due to age, gender, or residence. In particular, youth aged 18 years and older had difficulty obtaining any form of health-care insurance. Some youth with insurance through a parent would delay care or refuse care in order to avoid disclosure of infection status.

Transportation-related barriers were identified in almost every interview, with an emphasis on lack of availability, complexity of public transport systems, and difficulty in accessing transportation support. Some clinics provided transportation, but these services were associated with considerable stigma (See Table 1 “Resources”). Relationships of clinic staff, health departments, and local agencies also affected adolescent linkage to care. Staff described challenges with information sharing and turf issues between the local health department, partnering agencies, and their program. Staff also described the unwillingness of both health departments and local HIV/AIDS agencies to provide information for fear of losing clients, and thus funding associated with service provision (See Table 1 “Influence and control”).

Solutions to macro-level barriers (See Table 1 Section on Solutions) often involved individualized, micro-level approaches to address the immediate needs of youth without contributing to changes in the macro-system barriers. Adolescents’ insurance issues were often resolved by workarounds that included use of other funding sources, or writing off costs until insurance was received. Grant funds were identified as potential sources of support for care, but this was acknowledged as a particularly unstable approach. Most clinics addressed transportation issues by providing vouchers or tokens for public transportation, usually in advance of appointments. For initial appointments, program staff frequently transported youth, which also allowed provision of emotional support during the first visit. Suggestions of how to improve relationships with partner agencies included assurance that, care initiative staff were actively participating in community coalitions to improve these relationships.

Meso-level structural barriers and solutions—Meso-level structural barriers focused on a clinic’s physical space, personnel issues (such as levels of acceptance and general personality), and procedural issues (such as when in the local collaboration care initiative staff can join the linkage to care process) (See Table 1, “Contextual Factors”). The geographic location of the clinic within a larger medical facility, as well as within a specific community, was discussed as a potential barrier, especially if the clinic was HIV-specific. Staff characteristics were identified as either a facilitator or a barrier toward linkage to care for adolescents. Discomfort with gender issues, implied heterosexual bias, and disapproval of the quirks of adolescent behaviors, all influenced the ease of linkage to care. These issues

were particularly relevant when the clinic served transgender youth, or both adolescent and pediatric patients.

A major issue in the care initiative implementation was a sense that the care initiative duplicated linkage to care services that were perceived to be sufficient. In turn, at some sites the program staff felt excluded from the LTC process, as they were only able to talk to adolescents once they had already been linked. This lack of inclusion limited the services that program staff could provide. The care initiative staff suggested that *had* the linkage to care coordinator or clinic director worked more closely with the clinic staff to explain the role of the program, and highlighted that they were not being introduced to assume other people's positions, but instead to support them, *the services would have been less duplicative*.

Solutions (Table 1) focused on organizing clinic spaces to adapt them to the adolescent population, conducting competency training with site personnel, and trying to engage the outreach worker earlier in the linkage to care process. Suggestions for increasing youth friendliness, including adapting multiple-use space to be specifically responsive to adolescent needs, was seen as especially challenging but important for improving outcomes. In terms of personnel-related barriers, specific staff training to raise awareness and sensitivity to youth was seen as important, especially in interactions with transgender and other sexual minority youth. This approach included sensitivity to access needs, sometimes outside of the clinic's usual working hours.

Micro-level structural barriers and solutions—Nearly all respondents mentioned micro-level barriers specific to the adolescents or their situation. These barriers included an adolescent's readiness for care or willingness to begin medication. Many staff described being an adolescent, or the period of adolescence itself, as a barrier to linkage to care (See Table 1 "Contextual Factors").

Solutions included continued contact (e.g., texting) with adolescents regardless of their readiness for care, and providing services that were non HIV-related. Program staff described linkage to care as a process that takes time, especially if the adolescent is in denial. Maintaining contact and providing incentives for contact was important, even when youth were not ready to be immediately linked to care. These solutions, to engage with the adolescents even if they are not ready to attend clinic and provide additional services, were suggested as ways to alleviate barriers to linkage to care, and increase eventual retention in the clinic.

Discussion

The results highlight macro-, meso-, and micro-levels of structural barriers – and solutions – to LTC for HIV positive adolescents. Although individually focused efforts are undoubtedly needed to support linkage to care, structural change is essential to achieve the goal of "seamless" care as described in the National HIV/AIDS Strategy (Office of National AIDS Policy [ONAP], 2012). The Affordable Care Act could cover HIV-positive individuals that are currently treated with Ryan White monies, which could allow these monies to be re-allocated for supplemental services like mental health, case manager and so on. As adolescents under 18 years have an easier time enrolling in Medicaid, however, it is uncertain that the Affordable Care Act will affect adolescents as much as adults. Care initiative process data show that solutions to structural barriers are frequently expedient and fragile. The solutions often represent "micro-level" responses to "macro-level" barriers. These discrepancies are particularly salient for adolescents who inhabit a unique developmental stage and are also reliant on other friends or family members for access to

resources and support. For example, an older adolescent without any dependents may have a more difficult time getting covered under Medicaid/Ryan White funding (macro-level barrier), but as a solution the clinic uses small pots of grant monies to cover the adolescent's health care (micro-level solution). Broadly, representative coalitions were described as necessary to ensure that important structural barriers are not masked by less efficient contingency solutions that might not be sustainable.

From a macro-level perspective of structural barriers, health-care insurance and transportation were significant issues. Adolescents and young adults –especially poor and minority – are over-represented in the approximately 10% of American children and adolescents without health-care insurance of any kind (Bethell et al., 2011). Lack of insurance also limits subsequent care engagement of newly diagnosed youth, especially if alternative means of payment are unavailable (Moore, 2011; Ulett et al., 2009). Our findings align with other research showing that transportation is uniformly cited as macro-level barrier to care (Fortenberry, Martinez, Rudy, & Monte, 2012; Kempf et al., 2010; Zaller et al., 2008), especially in areas with fragmented and limited public transportation systems. Reduced cost or free transportation services for HIV-positive patients have been shown to improve HIV-related health outcomes (Kissinger et al., 1995; Magnus et al., 2001; Sherer et al., 2002). However, our data demonstrate the difficulty of provision of transportation, particularly in a resource-limited time, that is associated with HIV-related care.

Clinic staff reported that the introduction of the care initiative was often met with indifference or even active resistance by health departments and community organizations providing HIV-related services for youth (Fortenberry et al., 2012; Straub et al., 2007; Ziff et al., 2006). Solutions required the investment of time, identification of common ground, and demonstration of the benefit of coordinated approaches to linkage to care. This highlights the importance of creating a network of community partnerships and relationships, and shows how linkage to care is a process that requires a complex blend of public and private service providers (Fortenberry et al., 2012; Mugavero et al., 2011).

Meso-level factors affecting linkage to care focused on physical space and the attitudes and behaviors of clinic personnel. Other studies have shown that staff attitudes often communicate larger social values of homophobia and HIV-related stigma (Kempf et al., 2010; Lichtenstein, 2003). The concept of adolescent friendliness reflects the importance of creating spaces where HIV-positive adolescents – many of whom are marginalized sexual minorities – feel secure and not judged (A. E. Hutton, 2003; N. Hutton, [personal interview, conducted by Morgan Philbin, March 15, 2006]; Macfarlane & Blum, 2001). However, few studies aside from results stemming from this program have directly assessed what constitutes adolescent friendly qualities of clinics providing HIV-related care (Tanner et al., 2012).

Micro-level level factors, such as individual readiness for care, have the potential to directly affect linkage to care. These data showed that LTC often required flexibility and persistence in maintaining contact with adolescents not yet ready to engage in HIV care. Though often seen as a structural issue, the stigma that results from an HIV-diagnosis, and fear of rejection by family, peers, and community has individual implications (Moore, 2011). Development of self- and social-identities during middle and late adolescence additionally affect the acceptance of the HIV diagnosis, which is associated with higher rates of depression, anxiety, social isolation, and stigma among HIV-positive adolescents (American Academy of Pediatrics [AAP], 1997; Blum, 1992; Futterman, Chabon, & Hoffman, 2000; Orr, Weller, Satterwhite, & Pless, 1984; Pao et al., 2000; Safren et al., 2004).

Strengths and limitations

These data represent an exploration of structural facilitators and barriers in the linkage to care process for adolescents from a wide geographic area (Straub et al., 2007). We relied on the perspectives of the care initiative clinical staff, without speaking directly to the adolescents, which could limit insight into how these factors affected adolescents' linkage to care processes, and how they interpret the barriers and potential solutions. Barriers were assessed at the beginning of the care initiative scale-up and we will continue to monitor how these have changed and how barriers continue to affect linkage to care processes for adolescents.

Conclusions

The federal government is increasingly requiring that HIV testing programs have linkage plans and partners in place in order to continue receiving funding (ONAP, 2012). Across the wide geographic implementation of the care initiative, there was agreement regarding certain barriers, as well as suggestions of how to address these barriers at multiple levels, such as restructuring of funding streams or insurance procedures to facilitate early entry into care and the wider provision of transportation services. At times the clinics may not have had control to change things at the macro-level (e.g., Ryan White funding eligibility), which suggests that creative thinking and responses are needed to change the local macro structure to complement the existing micro-level solutions. Our study shows that macro-level solutions are necessary to address macro-level barriers, and that meso-level solutions are best suited for meso-level barriers. Specifically, study findings suggest that it will likely be more effective and sustainable to address most barriers with macro-level solutions, and if that is not possible, to use higher order solutions (e.g., policy change) as opposed to lower order solutions (e.g., clinical funding).

References

- American Academy of Pediatrics (AAP). Disclosure of illness status to children and adolescents with HIV infection. *Pediatrics*. 1997; 103(1):164–166. Retrieved from <http://pediatrics.aappublications.org/content/103/1/164.full.html>.
- Bethell CD, Kogan MD, Strickland BB, Schor EL, Robertson J, Newacheck PW. A national and state profile of leading health problems and health care quality for US children: Key insurance disparities and across-state variations. *Academic Pediatrics*. 2011; 11(3):S22–S33. [PubMed: 21570014]
- Blankenship KM, Bray SJ, Merson MH. Structural interventions in public health. *Aids*. 2000; 14:S11. [PubMed: 10981470]
- Blum RWM. Chronic illness and disability in adolescence. *Journal of Adolescent Health*. 1992; 13(5): 364–368. [PubMed: 1390787]
- Centers for Disease Control and Prevention (CDC). Surveillance overview: HIV incidence. Atlanta, GA: Author; 2013.
- Chutuape KS, Willard N, Sanchez K, Straub DM, Ochoa TN, Howell K, Ellen JM. Mobilizing communities around HIV prevention for youth: How three coalitions applied key strategies to bring about structural changes. *AIDS Education and Prevention: Official Publication of the International Society for AIDS Education*. 2010; 22(1):15. [PubMed: 20166784]
- Cook JA, Cohen MH, Grey D, Kirstein L, Burke J, Anastos K, Young M. Use of highly active antiretroviral therapy in a cohort of HIV-seropositive women. *American Journal of Public Health*. 2002; 92(1):82–87. [PubMed: 11772767]
- Craw J, Gardner L, Rossman A, Gruber DA, Noreen OD, Jordan D, Phillips K. Structural factors and best practices in implementing a linkage to HIV care program using the ARTAS model. *BMC Health Services Research*. 2010; 10(1):246. [PubMed: 20727189]
- Craw JA, Gardner LJ, Marks G, Rapp RC, Bosshart J, Duffus WA, Schmitt K. Brief strengths-based case management promotes entry into HIV medical care: Results of the antiretroviral treatment

- access study-II. *Journal of Acquired Immune Deficiency Syndromes*. 2008; 47(5):597–606. [PubMed: 18285714]
- Cunningham WE, Andersen RM, Katz MH, Stein MD, Turner BJ, Crystal S, Shapiro MF. The impact of competing subsistence needs and barriers on access to medical care for persons with human immunodeficiency virus receiving care in the United States. *Medical Care*. 1999; 37(12):1270–1281. [PubMed: 10599608]
- Fortenberry JD, Martinez J, Rudy BJ, Monte D. Linkage to care for HIV-Positive adolescents: A multisite study of the adolescent medicine trials units of the adolescent trials network. *Journal of Adolescent Health*. 2012; 51(6):551–556. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1054139X12001334>. [PubMed: 23174464]
- Futterman D, Chabon B, Hoffman ND. HIV and AIDS in adolescents. *Pediatric Clinics of North America*. 2000; 47(1):171–188. [PubMed: 10697647]
- Gardner LI, Marks G, Craw J, Metsch L, Strathdee S, Anderson-Mahoney P, del Rio C. Demographic, psychological, and behavioral modifiers of the antiretroviral treatment access study(ARTAS) intervention. *AIDS Patient Care and STDs*. 2009; 23(9):735–742. [PubMed: 19645619]
- Giordano TP, Gifford AL, White AC, Almazor MES, Rabeneck L, Hartman C, Morgan RO. Retention in care: A challenge to survival with HIV infection. *Clinical Infectious Diseases*. 2007; 44(11): 1493–1499. [PubMed: 17479948]
- Giordano TP, Visnegarwala F, White AC, Troisi CL, Frankowski RF, Hartman CM, Grimes RM. Patients referred to an urban HIV clinic frequently fail to establish care: Factors predicting failure. *AIDS Care*. 2005; 17:773–783. [PubMed: 16036264]
- Glaser, BG.; Strauss, AL. *The discovery of grounded theory: Strategies for qualitative research*. London: Aldine de Gruyter; 1967.
- Hutton AE. Adolescents discuss sharing space in an adolescent ward. *Neonatal, Paediatric and Child Health Nursing*. 2003; 2(2):24–29.
- Kempf MC, McLeod J, Boehme AK, Walcott MW, Wright L, Seal P, Moneyham L. A qualitative study of the barriers and facilitators to retention-in-care among HIV-positive women in the rural southeastern United States: Implications for targeted interventions. *AIDS Patient Care and STDs*. 2010; 24(8):515–520. Retrieved from <http://online.liebert-pub.com/doi/abs/10.1089/apc.2010.0065>. [PubMed: 20672971]
- Kissinger P, Clark R, Rice J, Kutzen H, Morse A, Brandon W. Evaluation of a program to remove barriers to public health care for women with HIV infection. *Southern Medical Journal*. 1995; 88(11):1121. [PubMed: 7481982]
- Latkin C, Weeks MR, Glasman L, Galletly C, Albarracin D. A dynamic social systems model for considering structural factors in HIV prevention and detection. *AIDS and Behavior*. 2010; 14(S2): 222–238. [PubMed: 20838871]
- Lichtenstein B. Stigma as a barrier to treatment of sexually transmitted infection in the American deep south: Issues of race, gender and poverty. *Social Science & Medicine*. 2003; 57(12):2435–2445. [PubMed: 14572849]
- Lillie-Blanton M, Stone VE, Snow Jones A, Levi J, Golub ET, Cohen MH, Wilson TE. Association of race, substance abuse, and health insurance coverage with use of highly active antiretroviral therapy among HIV-infected women, 2005. *American Journal of Public Health*. 2010; 100(8): 1493–1499. [PubMed: 19910347]
- Macfarlane A, Blum RW. Do we need specialist adolescent units in hospitals? *British Medical Journal*. 2001; 322(7292):941–942. [PubMed: 11312213]
- Magnus M, Schmidt N, Kirkhart K, Schieffelin C, Fuchs N, Brown B, Kissinger PJ. Association between ancillary services and clinical and behavioral outcomes among HIV-infected women. *AIDS Patient Care and STDs*. 2001; 15(3):137–145. [PubMed: 11313026]
- McCoy, SI. Doctoral dissertation. Chapel Hill: HIV ATN LTC dissertation database; 2002. HIV testing and linkage to care in North Carolina: Early diagnosis, late diagnosis and delayed presentation to care.
- Metsch LR, Pereyra M, Messinger S, del Rio C, Strathdee SA, Anderson-Mahoney P, Gardner L. HIV transmission risk behaviors among HIV-infected persons who are successfully linked to care. *Clinical Infectious Diseases*. 2008; 47(4):577–584. [PubMed: 18624629]

- Moore RD. Epidemiology of HIV infection in the United States: Implications for linkage to care. *Clinical Infectious Diseases*. 2011; 52(Suppl. 2):S208. Retrieved from http://cid.oxfordjournals.org/content/52/suppl_2/S208.short. [PubMed: 21342909]
- Mugavero MJ, Norton WE, Saag MS. Health care system and policy factors influencing engagement in HIV medical care: Piecing together the fragments of a fractured health care delivery system. *Clinical Infectious Diseases*. 2011; 52(Suppl. 2):S238. Retrieved from http://cid.oxfordjournals.org/content/52/suppl_2/S238.short. [PubMed: 21342913]
- Muhr, T. ATLAS/ti (Version 4.2.) [Computer software]. Berlin: Scientific Software Development; 2004.
- Office of National AIDS Policy(ONAP). National HIV/AIDS strategy: Update of the 2011-2012 federal efforts to implement the National HIV/AIDS strategy. 2012. Retrieved from <http://www.aids.gov/federal-resources/national-hiv-aids-strategy/documents/index.html>
- Orr DP, Weller SC, Satterwhite B, Pless IB. Psychosocial implications of chronic illness in adolescence. *The Journal of Pediatrics*. 1984; 104:152–157. [PubMed: 6690661] 1
- Pao M, Lyon M, D'Angelo L, Schuman W, Tipnis T, Mrazek D. Psychiatric diagnoses in adolescents seropositive for the human immunodeficiency virus. *Archives of Pediatrics and Adolescent Medicine*. 2000; 154(3):240. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10710020>. [PubMed: 10710020]
- Safren SA, Hendriksen ES, Mayer KH, Mimiaga MJ, Pickard R, Otto MW. Cognitive-behavioral therapy for HIV medication adherence and depression. *Cognitive and Behavioral Practice*. 2004; 11(4):415–424.
- Sherer R, Stieglitz K, Narra J, Jasek J, Green L, Moore B, Cohen M. HIV multidisciplinary teams work: Support services improve access to and retention in HIV primary care. *AIDS Care*. 2002; 14(S1):31–44.
- Stein M, Crystal S, Cunningham W, Ananthanarayanan A, Andersen R, Turner B, Bozette S. Delays in seeking HIV care due to competing caregiver responsibilities. *American Journal of Public Health*. 2000; 90(7):1138–1140. [PubMed: 10897195]
- Straub DM, Deeds BG, Willard N, Castor J, Peralta L, Francisco VT. Adolescent Trials Network for H. I. V. A. I. Partnership selection and formation: A case study of developing adolescent health community-researcher partnerships in fifteen US communities. *Journal of Adolescent Health*. 2007; 40(6):489–498. [PubMed: 17531754]
- Tanner, A.; Philbin, MM.; Duval, A.; Ellen, J.; Kapogiannis, B.; Fortenberry, JD. Linking HIV positive adolescents to care: The role and process of 'youth friendly' clinical environments; Paper presented at the American Public Health Association Conference; San Francisco, CA. 2012.
- Tanner A, Philbin MM, Duval A, Ellen J, Kapogiannis B, Fortenberry JD. Linking HIV-positive adolescents into care: The effects of relationships between local health departments and adolescent medicine clinics. *Journal of HIV and Social Services*. in press.
- Tripathi A, Youmans E, Gibson JJ, Duffus WA. The impact of retention in early HIV medical care on viro-immunological parameters and survival: A statewide study. *AIDS Research and Human Retroviruses*. 2011; 27(7):751–758. Retrieved from <http://online.liebertpub.com/doi/abs/10.1089/aid.2010.0268>. [PubMed: 21142607]
- Ulett KB, Willig JH, Lin H-Y, Routman JS, Abroms S, Allison J, Mugavero M. The therapeutic implications of timely linkage and early retention in HIV care. *AIDS Patient Care and STDs*. 2009; 23(1):41–49. [PubMed: 19055408]
- Zaller ND, Holmes L, Dyl AC, Mitty JA, Beckwith CG, Flanigan TP, Rich JD. Linkage to treatment and supportive services among HIV-positive ex-offenders in Project Bridge. *Journal of Health Care for the Poor and Underserved*. 2008; 19(2):522–531. [PubMed: 18469423]
- Ziff MA, Harper GW, Chutuape KS, Deeds BG, Futterman D, Francisco VT, Ellen JM. Laying the foundation for connect to protect®: A multi-site community mobilization intervention to reduce HIV/AIDS incidence and prevalence among urban youth. *Journal of Urban Health*. 2006; 83(3): 506–522. [PubMed: 16739051]

Table 1

Representative quotes on barriers and solutions for linking youth to care by structural dimension and barrier-solution type.

Structural dimensions	Barrier	Solution	Barrier-solution type
<i>Resources</i>			
Insurance	... And many times what the insurance company or Medicaid is asking for is a bill that comes to your house.... of course for a young person who is 16 years old ...what bill do they probably have? Site R	And we have grants like children's medical services that go up to 21, will help support stuff. Kind of a variety of hodge-podge of grants and donations. And whatever billing we can do. Site H	Macro-Micro
Transportation	... we're dealing with youth who have no jobs so you can't even buy a bus pass, and if you need a bus pass it needs to be mailed to you so you have to get in contact with your case manager at least two weeks before your appointment. Site T	I think the biggest thing is the taxi, being able to taxi a kid from 40 miles away to get to a doctor's appointment just to make sure that he gets here ... Site S	Macro-Micro
	All my clients are like, "Please don't come to the house in a white [health department] van. Everybody going to see that white van." You don't want to ride what's free but you don't have money to ride. Site G	I usually try to go to the first appointment with them. I don't force it upon them but just a friendly, "Hey, if you want me to come, I'm more than willing to do that. Pick you up, drop you off and I can still give you bus cards afterwards." Site P	Meso-Micro
<i>Influence & control</i>			
Inter-agency communication and cooperation	Instead of the director saying, 'now we're not going to do it that way', she went on and said, "we support them" and then later said, "you're on your own" so that doesn't give us much. Site I	The outreach worker is interacting with [partner agencies] very frequently. Whenever they have testing events in the community, she's participating. And then we see them at the meetings, the Coalition on HIV/AIDS meetings. We participate with them because they are sitting on subcommittees. So we're always working together in some fashion. Site G	Meso-Meso
Personnel	Yeah, that's got to be tough and that I don't know how to help heterosexuals with that [transgender]. They're the same person. They're dressed differently... The personality hasn't changed. They were feminine dressed as a boy and now they're feminine and comfortable, dressed how they want to be. Site T	We really are very gay friendly. And we've done some training around that specifically. We did it for the front desk.... we need everybody to be cool about our transgendered youth. Or our youth that are cross-dressing, or are very effeminate or whatever. Site G	Meso-Meso
<i>Contextual factors</i>			
Clinic location	The rooms have giraffes on the walls and monkeys juggling, and chalkboards at four-year-old level with chalk. So you're 19, you're HIV-positive, and you're a gay boy. You're like, "What the heck am I doing in here?" Site T	Making sure the boards have something that they will want to read about, what I might put on my board for adolescents is marijuana, drinking, yeah. Sociable things that could lead to unprotected sex... Not having cartoons on the television when they come in. Site J	Meso-Meso
Integrating SMILE into existing programs	I think they only let me do that [complete insurance forms] because they have so many kids that they just don't physically have the time. [The social workers] are very protective of what they do. Site Q	The [site staff] were very standoffish and we sort of like let them just have that for a while, and get to know me and get more comfortable with me. Site Q	Meso-Micro
Accepting diagnosis	If you're not ready to accept your diagnosis, you're not going to come in for care. So usually by the time someone is coming in for care that has been addressed in some way, although it may not be, they may not really be completely accepting the diagnosis but they're coming in for care in some form of acceptance. Site N	A lot of times it's working with patients outside of the clinic so offering all of our supportive services but not pressuring them to have to come in for medical care. Site Q	Meso-Micro

Structural dimensions	Barrier	Solution	Barrier-solution type
Adolescence	A lot of them are still in that concrete operational phase. A lot of them are still just dealing with regular adolescence. Now you got to throw this diagnosis in there. Site I	So in the beginning I may call 50 times to get them to come in... we're also finding texting to be quite an effective way of communicating with kids. They actually respond better to texts, and I think texting is easier because it's immediate... Site N	Meso-Micro

The Metropolitan Atlanta community adolescent rapid testing initiative study: closing the gaps in HIV care among youth in Atlanta, Georgia, USA

Andres F. Camacho-Gonzalez^{a,b}, Scott E. Gillespie^c,
LaTeshia Thomas-Seaton^d, Krystal Frieson^e, Sophia A. Hussen^{b,f},
Ashley Murray^g, Zaneta Gaul^{g,h}, Traci Leongⁱ, Chanda Graves^{b,j},
Madeline Y. Sutton^g and Rana Chakraborty^{a,b}

Objective: To determine the effectiveness of the Metropolitan Atlanta community adolescent rapid testing initiative (MACARTI) intervention relative to standard of care (SOC), in achieving early diagnosis, linkage, and retention among HIV-infected youth ages 18–24 years.

Design: MACARTI was a pilot single-center, prospective, nonrandomized study.

Methods: MACARTI combined nontraditional venue HIV testing, motivational interviewing, and case management. We collected demographic, clinical variables and calculated linkage and appointment adherence rates. We obtained SOC data from an adolescent HIV clinic. Longitudinal data were analyzed using inverse propensity treatment-weighted linear growth models; medians, interquartile ranges (IQR), means, and 95% confidence intervals are provided.

Results: MACARTI screened 435 participants and identified 49 (11.3%) HIV infections. The SOC arm enrolled 49 new HIV-infected individuals. The 98 participants, (49 in each arm) were: 85% men; 91% Black; mean age = 21 years (SD: 1.8). Overall, 63% were linked within 3 months of diagnosis; linkage was higher for MACARTI compared to SOC (96 vs. 57%, $P < 0.001$). Median linkage time for MACARTI participants compared to SOC was 0.39 (IQR: 0.20–0.72) vs. 1.77 (IQR: 1.12–12.65) months ($P < 0.001$). MACARTI appointment adherence was higher than SOC (86.1 vs. 77.2%, $P = 0.018$). In weight-adjusted models, mean CD4⁺ T-cell counts increased and mean HIV-1 RNA levels decreased in both arms over 12 months, but the differences were more pronounced in the MACARTI arm.

Conclusion: MACARTI successfully identified and linked HIV-infected youth in Atlanta, USA. MACARTI may serve as an effective linkage and care model for clinics serving HIV-infected youth.

Copyright © 2017 The Author(s). Published by Wolters Kluwer Health, Inc.

AIDS 2017, **31** (Suppl 3):S267–S275

Keywords: HIV testing, linkage in care, retention in care, youth

^aDivision of Pediatric Infectious Diseases, Department of Pediatrics, Emory University School of Medicine, ^bPonce Family and Youth Clinic, Grady Infectious Diseases Program, Grady Health Systems, ^cDepartment of Pediatrics, Emory University School of Medicine, ^dChildren's Healthcare of Atlanta, ^eAtlanta Veterans Affairs Medical Center, ^fHubert Department of Global Health, Rollins School of Public Health, Emory University, ^gDivision of HIV/AIDS Prevention, Centers for Disease Control and Prevention, ^hICF, ⁱDepartment of Biostatistics and Bioinformatics, Rollins School of Public Health, Emory University, and ^jDepartment of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, Georgia, USA.

Correspondence to Andres F. Camacho-Gonzalez, MD, MSc, Division of Pediatric Infectious Diseases, Department of Pediatrics, Emory University School of Medicine, 2015 Uppergate Dr Suite 500, Atlanta, GA 30322, USA.

Tel: +1 404 727 5642; fax: +1 404 727 9223; e-mail: acamac2@emory.edu

Received: 25 January 2017; revised: 12 April 2017; accepted: 13 April 2017.

DOI:10.1097/QAD.0000000000001512

ISSN 0269-9370 Copyright © 2017 The Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Introduction

In 2015, Georgia had the fifth highest rate of new HIV diagnoses (12.9/100 000) in the United States; 66% of HIV-infected individuals lived in and 69% of new diagnoses were reported from Atlanta Metropolitan Statistical Area (Atlanta) in 2011 [1,2]. Gaps along the HIV care continuum among youth in Atlanta are evidenced by low rates of testing, linkage to care, and viral suppression. Among people living with diagnosed HIV in Georgia, only 68% of youth are linked to care within 30 days, and just 52 and 38% of 13–19 and 20–24 year olds, respectively, achieved viral suppression at last measurement [2]. Additionally, Atlanta youth are likely to be diagnosed at more advanced stages of illness with more 13–24 year olds progressing to Stage 2 HIV (CD4⁺ T cell count 200–499) at diagnosis compared with any other age group [3,4].

Youth living with HIV, have a higher prevalence of psychosocial stressors contributing to unfavorable clinical outcomes and broader gaps along the HIV continuum of care compared with HIV-infected adults [5–9]. Singer's *et al.* [10] syndemic theory suggests that health care is affected by multiple epidemics that should be addressed simultaneously. Adverse social structures such as poverty, discrimination, stigma, and psychiatric comorbidities (including depressive disorder, substance use) increase risk for HIV acquisition and adversely impact adherence to HIV treatment [11–13].

Effective interventions tailored to HIV-infected youth are urgently needed. Hall *et al.* [6] showed that only 62% of youth between 13 and 24 years were linked and 44% retained in care nationally. The Reaching for Excellence in Adolescent Care and Health study documented that only 32.5% of youth achieved viral suppression [14], whereas a Pediatric AIDS Clinical Trials Group study demonstrated a 6-month retention rate of 58% [15]. These studies underscore deficiencies in traditional approaches of HIV diagnosis and management for youth [16,17]. Newer, comprehensive approaches tailored for youth that address HIV diagnosis and management, including psychiatric comorbidities and psychosocial stressors may improve HIV outcomes.

Despite recommendations for routine HIV testing in healthcare settings [16], implementation gaps remain; especially in racial/ethnic minority youth [17]. Venue-based HIV testing can improve testing rates among youth. A study with young MSM, showed that factors associated with no previous HIV test included young age (13–24 years) and self-identifying as non-Hispanic black or Hispanic [18]. Alternate testing strategies have shown high positivity rates among those tested in nontraditional settings [19].

Motivational interviewing has been successful in the treatment of chronic diseases, [20,21]; however, data on motivational interviewing-based interventions in HIV-

infected youth are limited [22]. A randomized trial in youth assessing the effectiveness of motivational interviewing delivered either by paraprofessional or professional staff showed improved retention in both arms with no differences between staff members delivering the intervention. However, preintervention data were incomplete for the majority of participants [23]. Another study used motivational interviewing and financial incentives with 11 perinatally infected youth with advanced immunosuppression; five achieved viral suppression at 1 year with a median CD4⁺ T cell count recovery of 140 cells/ μ l. This study was limited by small sample size and the potential confounding of financial incentives [24].

Case management has improved linkage/retention in care of HIV-infected individuals. The antiretroviral treatment access study (ARTAS) randomized recently diagnosed HIV-infected participants to a brief strength-based model of case management and care planning vs. usual care; 64% in the intervention arm were linked-to and retained-in care compared with 49% in the control arm [relative risk(adj) 1.41; $P=0.006$]. ARTAS is recommended as an effective intervention by the Centers for Disease Control and Prevention [25–27]. However, 90% of ARTAS participants were over 26 years of age and youth was underrepresented [28].

Building on these studies, we developed the Metropolitan Atlanta community adolescent rapid testing initiative (MACARTI) a multipronged intervention combining nontraditional venue HIV testing, motivational interviewing, and case management support to improve diagnosis, linkage, and retention in care of youth ages 18–24 years. The intervention started with a formative phase of focus groups with HIV-infected and uninfected youth to inform a youth friendly strategy [29,30]. Motivational interviewing/case management approach was implemented through the first year postdiagnosis using a developmentally informed approach.

Our goals were to: increase opportunities for HIV testing and diagnosis for youth at places where they routinely gather, and strengthen HIV treatment and care for those living with HIV using the MACARTI intervention.

Methods

Study design

MACARTI was a pilot single-center, prospective, nonrandomized interventional study of HIV-infected youth. Enrollment occurred from December 2012 through January 2015, with follow-up through February 2016. The MACARTI trial flow (Fig. 1) is described briefly below. The Emory Institutional Review Board, the Grady Research Oversight Committee, and the Centers for Disease Control and Prevention's National Center for HIV, viral hepatitis, Sexually Transmitted

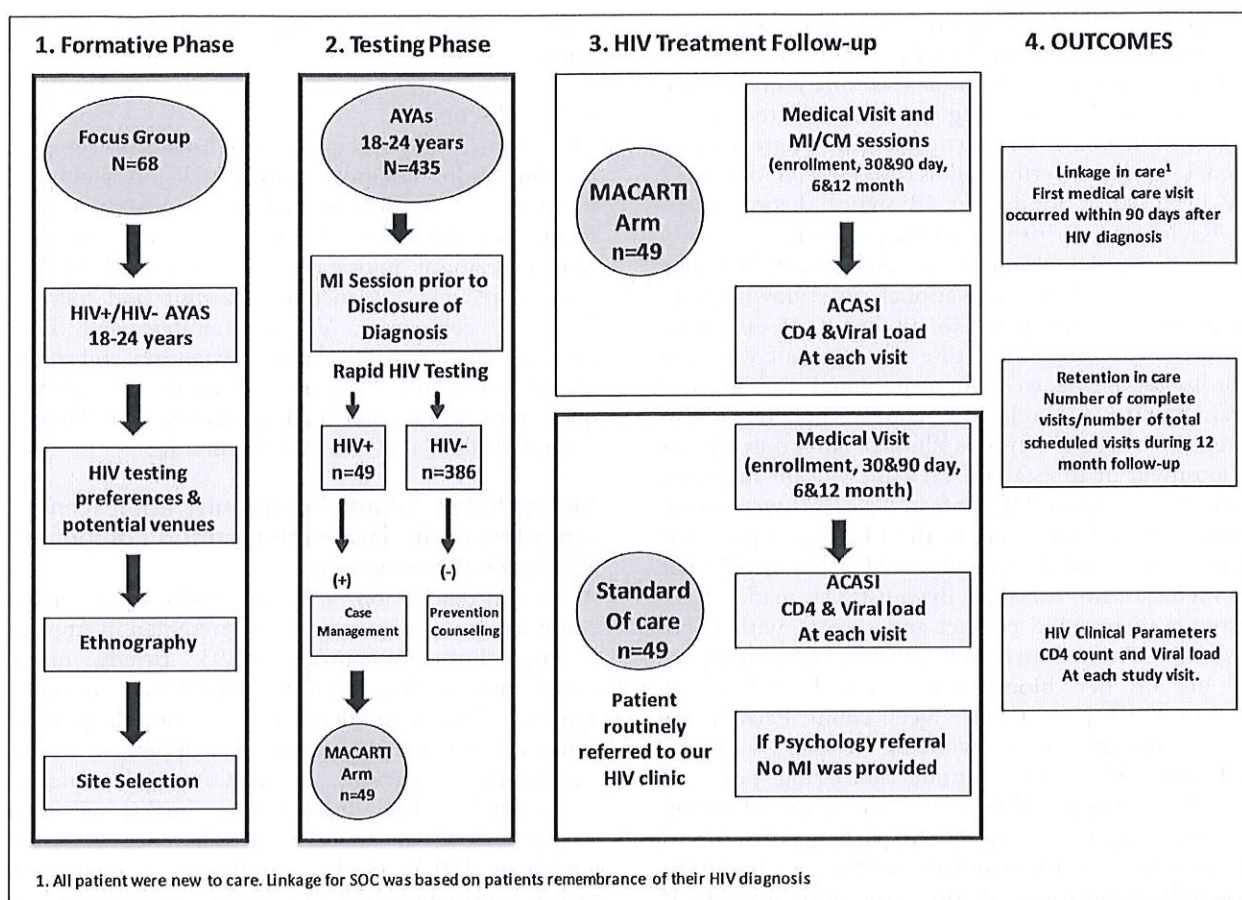


Fig. 1. The MACARTI trial flow diagram. ACASI, audio computer-assisted self-interview; CM, case management; MACARTI, Metropolitan Atlanta community adolescent rapid testing initiative; MI, motivational interviewing.

Disease, and Tuberculosis prevention approved this study. All participants provided written informed consent.

Formative phase and venue testing selection

We conducted focus groups with 68 HIV-infected and uninfected youth to understand testing preferences and potential venues for testing. In total, 17 focus groups (11 with HIV-infected, two with HIV-uninfected, and four with a mixed group of HIV-infected and uninfected youth) were conducted (four participants/group). Their responses were used to develop a youth friendly testing strategy, to select testing sites, and to better characterize postdiagnosis support. Following the focus groups, we conducted ethnographic observations of prospective venues to inform site selection [30]. Venues were selected only if they provided a private space for testing.

Testing phase

Study team

The MACARTI study staff implementing the intervention included: a physician (study Principal Investigator-A.F.C-G), a psychology fellow (K.F.), one case manager, and three recruiters/testers. Community partners (AID Atlanta, AIDS Healthcare Foundation, and Positive

Impact) also provided personnel during testing events as needed. Study personnel had no previous motivational interviewing experience and received training by the study psychologist and/or fellow (K.F. or C.G.), utilizing a motivational interviewing group facilitator manual with motivational interviewing information, motivational interviewing techniques, and motivational activities. Study staff learned theoretical and practical applications of motivational interviewing, including how to apply reflectively listening and ask open-ended questions, assess levels of motivation and confidence, and elicit barriers to adherence, confidence, and commitment language [31].

Participants

Participants in the testing phase included youth ages 18–24 years. The intervention arm (MACARTI) included youth diagnosed with HIV at nontraditional venues by either the study team or a community partner. The standard of care (SOC) arm included participants ages 18–24 years referred to the Ponce Family and Youth Clinic (PFYC) of Grady Health Systems for HIV care. Participants from both arms were selected only if they had a previously negative or unknown HIV test.

Metropolitan Atlanta community adolescent rapid testing initiative arm enrollment procedures

Members of the study team (at least one recruiter and one tester) conducted testing in venues selected during the formative phase. For participants who agreed to be tested, testing was performed using a 60 seconds INSTI HIV-1/HIV-2 antibody test (Biolytical Laboratories, Inc, Richmond, British Columbia, Canada; sensitivity and specificity of 99.8 and 99.5%, respectively) [32]. The tester conducted a motivational interviewing/case management session prior to disclosure of diagnosis. Motivational interviewing/case management was used prior to disclosure to address potential ambivalence toward seeking HIV-related care and to generate a plan of action to either improve clinical outcomes (if test was positive) or to establish HIV prevention strategies (if test was negative). HIV-infected patients were given instructions on how to get to the PFYC and provided information about documents needed for enrollment into medical care. After the diagnosis was made, study personnel maintained contact and assisted with clinic enrollment. At the initial medical visit, each participant had his or her blood drawn for HIV-1 RNA [Viral load (VL)] and CD4⁺ T-cell count. Participants had a motivational interviewing session with the psychology fellow to continue addressing potential ambivalence toward follow-up care with follow-up visits at 1, 3, 6, and 12 months. All participants received reminder calls the day prior to their study visits and for rescheduling purposes if the visit was missed. If participants stopped attending visits or answering phone calls from the study team, they were considered lost to follow-up, triggering a referral to the health department for tracking purposes. Participants also had the option to enroll in another HIV clinic (this was requested by two participants); we then helped these participants arrange appropriate follow-up. Participants enrolled at a non-PFYC site were asked if they wished to continue in the study. If they did, a signed release of medical records was required and the same number of visits occurred with study personnel travelling to their preferred clinic to deliver the intervention. No significant differences were noted with the delivery of the intervention at the non-PFYC sites.

Standard of care participants

SOC participants were newly HIV-diagnosed youth referred for care to the PFYC through conventional referrals from other agencies, hospitals, or medical providers. The PFYC policy is to try to link patients within 72 h after referral; therefore, confounding from the referral process/scheduling was not a concern. SOC participants received standard support services upon request including psychological and case management support. SOC psychological support met practice standards and case management support was limited to providing referrals for housing, food stamps, and transportation as needed. SOC participants also received

reminder calls prior to each appointment for rescheduling purposes from PFYC personnel.

Data collection

Once consented, participants from both arms completed baseline audio computer-assisted self-interview questionnaires. Data collected included demographic information, employment, education, drug use, and sexual history. Clinical information was obtained from the medical records and included baseline and follow-up CD4⁺ T cell count, VL, any antiretroviral therapy prescriptions, any AIDS-defining diagnoses, and condom use at last sexual encounter. Baseline and follow-up questionnaires were obtained at screening, enrollment, at 30 and 90 days, and at 6 and 12 months.

Metropolitan Atlanta community adolescent rapid testing initiative intervention components

Motivational interviewing

A detailed description of the motivational interviewing component of the intervention is presented in Appendix I, <http://links.lww.com/QAD/B93>. Briefly, motivational interviewing is an evidence-based therapeutic approach. Treatment fidelity depends upon the provider's adherence to the 'spirit' of the approach (namely, partnership, acceptance, compassion, and evocation), which can be reliably measured (see quality and fidelity section below) as opposed to adherence to specific guidelines [20,31,33–35]. Motivational interviewing focuses on strengths and self-efficacy, whereas emphasizing collaboration, empowerment, respect for choice, and understanding of the participant's perspective [33]. MACARTI participants received motivational interviewing sessions at the venue before disclosure of HIV diagnosis, and at all study visits.

Strength-based model of case management

A strength-based model of case management was employed to empower the client, build self-esteem, and enable the participants' utilization of available resources. This model provides care that is beyond accessing services; it empowers participants to identify their own needs in utilizing available resources and services. Case management was provided at each study visit for the MACARTI arm participants. Problem-solving, goal planning, and guidance counseling were used to help participants with concerns identified by case management. An average meeting for case management lasted approximately 45–60 min.

Quality and fidelity

A standard operating procedure manual was developed and available to study staff, ensuring quality and fidelity to study procedures. To evaluate fidelity to the motivational interviewing protocol, the motivational interviewing trainer assessed 20% of the sessions for consistent use of motivational interviewing techniques and retrained staff if deviations were noted.

Definitions

Linkage to care: the first medical care visit occurred within 90 days after HIV diagnosis.

Retention in care: number of completed visits divided by the number of total scheduled visits during the 12-month follow-up [36], among participants who attended at least one medical care visit. Individuals who never linked (4/98; 4%) were not counted in retention in care calculations.

Viral suppression: number of participants who had a VL of less than 40 copies/ml at the 1-year study visit, among participants who completed the study.

Statistical methods

Statistical analyses were performed using SAS v9.4 (Cary, North Carolina, USA) and CRAN R v.3.3 (Vienna, Austria), and significance was evaluated two-sided at the 0.05 level. Demographic, drug use, sexual history, and clinical characteristics were summarized overall and by SOC and MACARTI arms using means and standard deviations, medians and interquartile ranges (IQR), or frequencies and percentages as appropriate. Two-sample testing, including both parametric (*t*-tests and χ^2 tests) and nonparametric (Wilcoxon and Fisher's) approaches were used to gauge dissimilarities across the study groups at baseline. Differences in visit attendance, retention, and linkage between SOC and MACARTI arms were similarly considered. Owing to noted baseline covariate differences across SOC and MACARTI arms, an inverse propensity treatment-weighted (IPTW) score was calculated using binary logistic regression and added as an observation weight characteristic to the sample, to control for baseline study arm disparities.

Linear mixed-effects growth models were used to evaluate statistical differences over study visit follow-up in CD4⁺ T cell count and VL between the SOC and MACARTI arms. The fixed effect for each model was treatment arm (2 levels), and the random effects were participant-specific intercepts and study visit slopes. Interactions between treatment arm and study visit were included, and because of curve-linear associations in the raw data, quadratic terms were added to each model for study visit. For CD4⁺ T cell count, a square-root transformation was applied to the outcome; for VL, both the outcome values and study visit were natural-log transformed. All observations in the mixed-effects regression models were evaluated unweighted and weighted using the IPTW score. All presented results have been back transformed to their original units, and results are given as least-squares mean estimates with associated 95% confidence intervals (CI). Further details for the propensity and linear growth models are provided in Appendix II, <http://links.lww.com/QAD/B93>.

Results

We tested 435 participants and identified 49 as HIV infected, for a positivity rate of 11.3%. Multiple sites were used for testing; however, the highest positivity rate was seen in nightclubs (30%) and street testing in areas identified as high risk by ethnographic studies (18%; Table 1). The SOC arm screened 62 participants to enroll 49 HIV-infected individuals new to HIV care; 13 were excluded because they were not new to HIV care. In total, 98 participants, 49 in each arm, were enrolled; 85% men; 91% Black; mean age was 21 years (SD : 1.8 years); 78% identified as homosexual/bisexual or queer; 62% had high school education or less; 23% percentage reported currently using drugs (marijuana, cocaine, heroin, methamphetamines, ecstasy, inhalant, or other); 14% reported a history of abuse (Table 2). After IPTW adjustment, all differences were balanced between MACARTI arm and SOC participants (Table 2), per a weighted standardized difference cutoff of 0.25.

Baseline HIV characteristics

Compared to SOC, MACARTI arm participants reported fewer AIDS-defining conditions (20 vs. 51%, $P=0.002$) and a higher mean CD4⁺ T cell count [317 (IQR : 218–512) vs. 196.5 (IQR : 61–377.5) cells/ μ l, $P=0.007$].

Linkage to care

Overall, 63% of participants were linked to care within 90 days of diagnosis; however, linkage was higher for the MACARTI arm compared to SOC (88 vs. 39%, $P<0.001$). Weighted, MACARTI linkage remained higher than SOC (96 vs. 57%, $P<0.001$). Weighted median linkage time for MACARTI participants compared to SOC was 0.39 (IQR : 0.20–0.72) vs. 1.77 (IQR : 1.12–12.65) months ($P<0.001$). An IPTW-adjusted multivariable logistic model showed that MACARTI participants had significantly higher odds

Table 1. Testing venues and positivity rate. The Metropolitan Atlanta community adolescent rapid testing initiative trial, Atlanta, Georgia, USA, 2012–2016.

Venue type	Number tested	Identified positives	Positivity rate
Night clubs	122	37	30%
College campus	98	5	5%
Street testing ^a	38	7	18%
Private parties	19	0	0%
Pride events	38	0	0%
Malls and surroundings	6	0	0%
Fairs	19	0	0%
Shelters	95	0	0%
Total	435	49	

^aPreviously determined high risk areas by ethnographic studies.

Table 2. Baseline characteristics for standard of care and intervention participants, the MACARTI Trial, Atlanta, Georgia, USA, 2012–2016.

Characteristic, N (%)	Overall N=98	SOC N=49	MACARTI N=49	P value	Unweighted standard difference	Weighted standard difference ^a
Sex						
Men	83 (84.7%)	36 (73.5%)	47 (95.9%)	0.004	0.656	0.097
women	15 (15.3%)	13 (26.5%)	2 (4.1%)			
Race						
Black	89 (90.8%)	47 (95.9%)	42 (85.7%)	0.159	0.359	0.230
Other (white, Hispanic, other)	9 (9.2%)	2 (4.1%)	7 (14.3%)			
Age (year), mean ± SD	21.5 ± 1.8	21.3 ± 1.8	21.7 ± 1.7	0.175	0.276	0.083
Work status						
Employed/in school	74 (75.5%)	32 (65.3%)	42 (85.7%)	0.019	0.489	0.139
Neither	24 (24.5%)	17 (34.7%)	7 (14.3%)			
Education, N=97						
High school or less	60 (61.9%)	35 (72.9%)	25 (51%)	0.026	0.463	0.154
College or more	37 (38.1%)	13 (27.1%)	24 (49%)			
Ever abused alcohol	15 (15.3%)	3 (6.1%)	12 (24.5%)	0.022	0.528	0.083
Currently using drugs	22 (22.5%)	9 (18.4%)	13 (26.5%)	0.333	0.197	0.008
Abused type						
No abuse	84 (85.7%)	42 (85.7%)	42 (85.7%)	1.000	<0.001	<0.001
Abused	14 (14.3%)	7 (14.3%)	7 (14.3%)			
Sexual orientation						
Straight	22 (22.5%)	19 (38.8%)	3 (6.1%)	<0.001	0.850	0.198
Gay/bisexual/queer	76 (77.5%)	30 (61.2%)	46 (93.9%)			
Condom usage						
Always/usually	71 (72.5%)	33 (67.4%)	38 (77.6%)	0.258	0.230	0.249
Sometimes/never	27 (27.5%)	16 (32.6%)	11 (22.4%)			
Ever had STI ^b – patient report, N=97	47 (48.5%)	28 (57.1%)	19 (39.6%)	0.084	0.357	0.071
Any AIDS defining conditions, N=94	34 (36.2%)	25 (51%)	9 (20%)	0.002	0.685	0.112

MACARTI, Metropolitan Atlanta community adolescent rapid testing initiative; SOC, standard of care.

^aBaseline propensity balancing results are presented in the supplemental materials; a cutoff of <0.25 was utilized to indicate covariate balance.

^bSexually transmitted infection.

of linking within 90 days than those in SOC arm (adjusted odds ratio (aOR) = 18.17, 95% CI: 3.27–100.90).

Retention in care

MACARTI arm participants had better appointment adherence compared to SOC participants (86.1 vs. 77.2%, $P=0.018$). MACARTI participants also had better adherence throughout each of the follow-up study visits, albeit only significant at 90 days (Table 3). We also looked at the percentage of participants who attended

Table 3. Proportion of appointment adherence stratified by study arm, the Metropolitan Atlanta community adolescent rapid testing initiative trial, Atlanta, Georgia, USA, 2012–2016.

Visit, n/N (%)	Standard arm appointment adherence	MACARTI arm appointment adherence	P value
Unweighted			
30 days	35/49 (71.4%)	38/45 (84.4%)	0.130
90 days	37/49 (75.5%)	43/45 (95.6%)	0.008
6 months	30/49 (61.2%)	34/45 (75.6%)	0.137
12 months	30/49 (61.2%)	33/45 (73.3%)	0.212
Overall	181/245 (73.9%)	197/229 (86%)	0.001
Weighted			
30 days	42.6/52.7 (80.8%)	30/37.8 (79.3%)	0.864
90 days	36.8/52.7 (69.9%)	36.1/37.8 (95.6%)	0.002
6 months	32.4/52.7 (61.5%)	29.1/37.8 (77%)	0.119
12 months	39/52.7 (74%)	29.8/37.8 (78.8%)	0.603
Overall	203.6/263.6 (77.2%)	162.7/188.9 (86.1%)	0.018

MACARTI, Metropolitan Atlanta community adolescent rapid testing initiative.

80 and 100% of clinical visits scheduled. Although there was no statistical difference at 80% of scheduled visits, 50% of MACARTI participants attended 100% of the visits compared to 26% in the SOC arm ($P=0.017$).

CD4⁺ T cell count and HIV-1 RNA levels

CD4⁺ T cell counts increased significantly within both arms. Growth model estimates indicated MACARTI and SOC participants gained 149 and 101 cells/ μ l, respectively, at 12 months. Additionally, CD4⁺ T cell counts in the MACARTI arm were significantly higher at all study visits relative to the SOC arm (Appendix II-Table 3b, <http://links.lww.com/QAD/B93>). The growth trajectory in CD4⁺ T cell count over participant follow-up was significantly higher in the MACARTI arm relative to the SOC ($P=0.004$) (Fig. 2; Appendix II-Table 3a, <http://links.lww.com/QAD/B93>). Growth model estimates for VL indicated significant decreases in both arms, and although the overall growth trajectories were not significantly different between the two arms ($P=0.1$) (Fig. 2; Appendix II-Table 4a, <http://links.lww.com/QAD/B93>), MACARTI arm participants had significantly lower VL at 6 months ($P=0.031$) and 1 year ($P=0.008$), respectively (Appendix II-Table 4b, <http://links.lww.com/QAD/B93>). At 1 year, the weighted percentage of participants in the MACARTI arm who had an undetectable VL was 83% compared to 41% in SOC arm ($P<0.001$); concurrently, the odds of having an undetectable VL at 1 year was significantly higher in

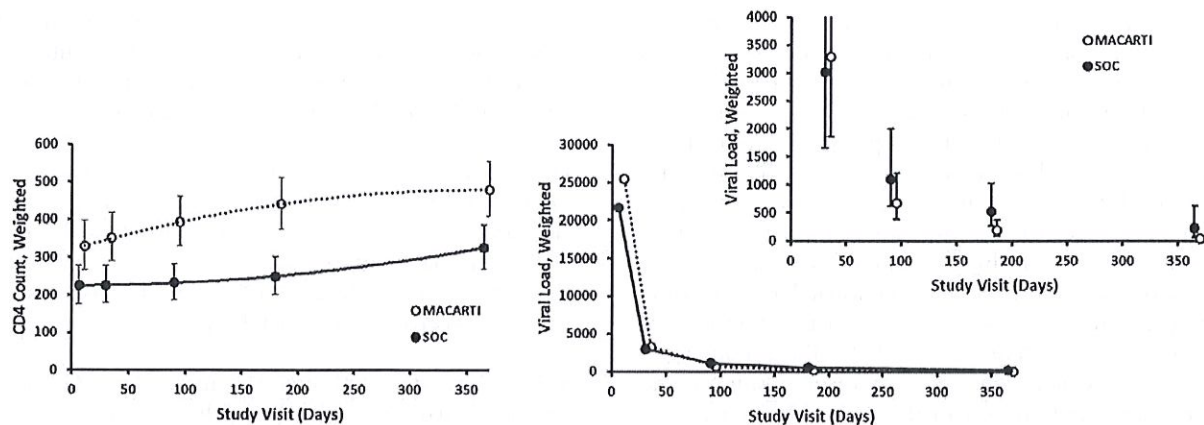


Fig. 2. Model-based change in CD4⁺ T cell count and viral load overtime by treatment arm – mean estimates and 95% confidence intervals, The MACARTI Trial, Atlanta, GA, 2012–2016.

MACARTI compared to the SOC arm (aOR = 6.80, 95% CI: 2.09–22.15, $P = 0.002$).

Discussion

The MACARTI intervention successfully identified HIV-infected youth in the community, linking them to HIV care within 90 days of diagnosis and achieving high retention rates consistent with national HIV/AIDS strategy goals [37]. Factors such as psychological distress, fear, lack of information, traumatic experiences, and lack of food, transport and housing, create syndemics of risk and add complexity to the care of HIV-infected youth [38]. MACARTI utilized motivational interviewing and case management to address behavioral, motivational, and socioeconomic factors that affect HIV care. In MACARTI, motivational interviewing started in the venue prior to disclosure of the diagnosis to build rapport, prepare participants emotionally in the event of a positive HIV test, and to enable participants to develop a plan of action proactively, regardless of the test result. After linkage, motivational interviewing promoted achievement of: attending medical visits, initiating and adhering to antiretroviral therapy, and achieving viral suppression.

MACARTI identified high-risk youth, validating our formative work and targeted testing strategy. Strategies designed without youth input may not be able to access this hard-to-reach population, underscoring the importance of developing youth-oriented, culturally competent interventions. MACARTI also enabled diagnosing youth at earlier stages of HIV disease compared with participants in the SOC arm. Early diagnosis and treatment of HIV has significant individual and public health advantages, including increased survival and decreased secondary transmission [39,40]. Interventions incorporating enhanced testing, linkage, and retention components can reduce HIV incidence by 54% and mortality rate by 64%; these outcomes are cost-effective compared to no intervention [41].

Although MACARTI was not powered to look at differences in HIV clinical parameters, we noted decreases in VL and increases in CD4⁺ T cell count in both arms. The CD4⁺ T cell count trend over time was significantly better for the MACARTI than the SOC arm participants. VL was lower at all time points for MACARTI arm participants; however, statistical significance was reached during the latter part of the follow-up period suggesting that youth-informed interventions, such as MACARTI, provide additional support time points beyond the first few months' postdiagnosis. This type of intervention may seem more labor intensive and challenging for broader implementation purposes; however, the psychosocial needs of youth may require such interventions to achieve the desired HIV continuum of care goals in this population.

The study has several limitations. First, the study population reflected a convenience sample that was not identified randomly, and the study was conducted in a single site. Although results may not be generalizable, the HIV epidemiology in Georgia reflects the current US epidemic [1]. Additionally, as the PFYC is the only adolescent HIV clinic in Georgia, we potentially accessed the majority of HIV-infected youth in Atlanta. Second, several differences in baseline characteristics were noted between groups. Some of these differences may be related to the venue selection process (not all potential venues were chosen as we required specific standards for testing confidentially and privacy), which may have shifted the MACARTI population toward a more employed/educated population that could afford entrance to specific sites. Additionally, as the intervention included targeted testing based on our formative phase results and positivity rates obtained in the different venues, we could have inadvertently oversampled the gay/bisexual population. However, the use of IPTW balanced both groups, which allowed us to control for differences in baseline characteristics during the analysis. Third, for the linear growth models, missing data were handled under a mixed-model framework, allowing for incomplete

observations in the analysis. For all other analyses, complete case data were used, and missing observations were removed. Concurrent with the mixed-model framework, missing data were assumed to be at random after visual evaluation of the participation logs for patterns in attrition, as well as quantitative analyses considering univariate differences in the baseline covariates between those that attended their study visits vs. those that did not. Although we feel missing at random is an appropriate assumption for our data, we acknowledge that some missing data may not be random. Fourth, although we found significant differences in CD4⁺ T cell count and VL trends, which suggests improved immunologic recovery and viral control in the MACARTI arm, our sample sizes were small; larger studies are warranted to confirm this finding.

In conclusion, despite the need of a larger randomized control study to further test this intervention, the results of the MACARTI trial are very promising and suggest that the combination of nontraditional venue testing, motivational interviewing, and case management has the potential to effectively decrease gaps for youth along the HIV care continuum.

Acknowledgements

The authors will like to acknowledge our community partners AIDS Healthcare Foundation, AID Atlanta and Positive Impact, the Fulton County Department of Health and Wellness and the LGTBQ unit of the Atlanta Police Department.

A.F.C.-G contributed in conception and design of the work; data acquisition, analysis, and interpretation, manuscript preparation, revision and submission of final manuscript. S.E.G., statistical analysis and interpretation, manuscript preparation and revision. L.T-S: Data acquisition, and interpretation, manuscript revision. K.F., data acquisition, analysis, and interpretation, manuscript revision. S.A.H., analysis, and interpretation of data, manuscript revision. A.M., analysis, and interpretation of data, manuscript revision. Z.G., analysis, and interpretation of data, manuscript revision. T.L., design of the work, analysis and interpretation of data, manuscript revision. C.G., design of the work, analysis and interpretation of data, manuscript revision. M.Y.S., design of the work, analysis and interpretation of data, manuscript revision. R.C., conception and design of the work; manuscript preparation, manuscript revision.

All authors reviewed the final submitted manuscript and gave their approval. All authors are in agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

These data were presented in part at the National HIV Prevention Conference, Atlanta, Georgia, December 2015 and at the Conference of Retroviruses and Opportunistic Infections, Seattle Washington, February 2017.

The work was supported by the Centers for Disease Control and Prevention, grant number 5U01PS003322, the National Center for Advancing Translational Sciences of the National Institutes of Health under Award number UL1TR000454 and by the Center for AIDS Research At Emory University (P30AI050409).

A.F.C.-G. has received research support from Gilead and Janssen Pharmaceuticals. R.C. has received research support from Gilead.

The findings and conclusions in the paper are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Conflicts of interest

There are no conflicts of interest.

References

1. The Georgia Department of Public Health, HIV Surveillance Fact Sheet, 2014. Accessed at https://dph.georgia.gov/sites/dph.georgia.gov/files/HIV_EPI_Fact%20Sheet_Surveillan-ce_2014.pdf. [Accessed 18 December 2016].
2. The Georgia Department of Public Health, HIV Care Continuum Report, Georgia, 2014. Accessed at https://dph.georgia.gov/sites/dph.georgia.gov/files/HIV%20Care%20Continuum%20-Gorgia%202014_07%2007%2016_final.pdf. [Accessed 18 December 2016].
3. HIV Surveillance Update. Online: Georgia Department of Public Health Epidemiology; 22 July 2013
4. Centers for Disease Control and Prevention (CDC). **HIV incidence among young men who have sex with men: seven U.S. cities, 1994-2000.** *MMWR Morb Mortal Wkly Rep* 2001; 50:440-444.
5. Philbin MM, Tanner AE, DuVal A, Ellen JM, Xu J, Kapogiannis B, *et al.* **Factors affecting linkage to care and engagement in care for newly diagnosed HIV-positive adolescents within fifteen adolescent medicine clinics in the United States.** *AIDS Behav* 2014; 18:1501-1510.
6. Hall HI, Gray KM, Tang T, Li J, Shouse L, Mermin J. **Retention in care of adults and adolescents living with HIV in 13 U.S. areas.** *J Acquir Immune Defic Syndr* 2012; 60:77-82.
7. Minniear TD, Gaur AH, Thridandapani A, Sinnock C, Tolley EA, Flynn PM. **Delayed entry into and failure to remain in HIV care among HIV-infected adolescents.** *AIDS Res Hum Retroviruses* 2013; 29:99-104.
8. Ryscavage P, Anderson EJ, Sutton SH, Reddy S, Taiwo B. **Clinical outcomes of adolescents and young adults in adult HIV care.** *J Acquir Immune Defic Syndr* 2011; 58:193-197.
9. Kuhns LM, Hottel AL, Garofalo R, Muldoon AL, Jaffe K, Bouris A, *et al.* **An index of multiple psychosocial, syndemic conditions is associated with antiretroviral medication adherence among HIV-positive youth.** *AIDS Patient Care STDS* 2016; 30:185-192.
10. Singer MC, Erickson PI, Badiane L, Diaz R, Ortiz D, Abraham T, *et al.* **Syndemics, sex and the city: understanding sexually transmitted diseases in social and cultural context.** *Soc Sci Med* 2006; 63:2010-2021.
11. Oldenburg CE, Perez-Brumer AG, Reisner SL. **Poverty matters: contextualizing the syndemic condition of psychological factors and newly diagnosed HIV infection in the United States.** *AIDS* 2014; 28:2763-2769.

12. Singer M, Clair S. Syndemics and public health: reconceptualizing disease in bio-social context. *Med Anthropol Q* 2003; 17:423–441.
13. Luo X, Liu G, Frush K, Hey LA. Children's health insurance status and emergency department utilization in the United States. *Pediatrics* 2003; 112:314–319.
14. Ding H, Wilson CM, Modjarrad K, McGwin G Jr, Tang J, Vermund SH. Predictors of suboptimal virologic response to highly active antiretroviral therapy among human immunodeficiency virus-infected adolescents: analyses of the reaching for excellence in adolescent care and health (REACH) project. *Arch Pediatr Adolesc Med* 2009; 163:1100–1105.
15. Rudy BJ, Lindsey JC, Flynn PM, Bosch RJ, Wilson CM, Hughes ME, *et al.*, Pediatric Aids Clinical Trials Group 381 Study Team. Immune reconstitution and predictors of virologic failure in adolescents infected through risk behaviors and initiating HAART: week 60 results from the PACTG 381 cohort. *AIDS Res Hum Retroviruses* 2006; 22:213–221.
16. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, *et al.*, Centers for Disease Control and Prevention (CDC). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep* 2006; 55:1–17.
17. Millett GA, Ding H, Marks G, Jeffries WL 4th, Bingham T, Lauby J, *et al.* Mistaken assumptions and missed opportunities: correlates of undiagnosed HIV infection among black and Latino men who have sex with men. *J Acquir Immune Defic Syndr* 2011; 58:64–71.
18. Mdofo R, Thomas PE, Walker A, Chavez P, Ethridge S, Oraka E, *et al.* Rapid HIV testing at gay pride events to reach previously untested MSM: U.S., 2009–2010. *Public Health Rep* 2014; 129:328–334.
19. Ellen JM, McCree DH, Muvva R, Chung SE, Miazad RM, Arrington-Sanders R, *et al.* Recruitment approaches to identifying newly diagnosed HIV infection among African American men who have sex with men. *Int J STD AIDS* 2013; 24:335–339.
20. Levensky ER, Forcehimes A, O'Donohue WT, Beitz K. Motivational interviewing: an evidence-based approach to counseling helps patients follow treatment recommendations. *Am J Nurs* 2007; 107:50–58.
21. Rubak S, Sandbaek A, Lauritzen T, Christensen B. Motivational interviewing: a systematic review and meta-analysis. *Br J Gen Pract* 2005; 55:305–312.
22. Mbuagbaw L, Ye C, Thabane L. Motivational interviewing for improving outcomes in youth living with HIV. *Cochrane Database Syst Rev* (9)2012CD009748.
23. Naar-King S, Outlaw A, Green-Jones M, Wright K, Parsons JT. Motivational interviewing by peer outreach workers: a pilot randomized clinical trial to retain adolescents and young adults in HIV care. *AIDS Care* 2009; 21:868–873.
24. Foster C, McDonald S, Frize G, Ayers S, Fidler S. 'Payment by Results': financial incentives and motivational interviewing, adherence interventions in young adults with perinatally acquired HIV-1 infection: a pilot program. *AIDS Patient Care STDS* 2014; 28:28–32.
25. Craw JA, Gardner LI, Marks G, Rapp RC, Bosshart J, Duffus WA, *et al.* Brief strengths-based case management promotes entry into HIV medical care: results of the antiretroviral treatment access study-II. *J Acquir Immune Defic Syndr* 2008; 47:597–606.
26. Academy for Educational Development Center on AIDS and Community Health (COACH). ARTAS Linkage Case Management Implementation manual. Available at <https://effectiveinterventions.cdc.gov/docs/default-source/artas-materials/artas-implementation-forms—cd/artas-im-june-2015.pdf?sfvrsn=2>. [Accessed 29 December 2016].
27. Centers for Disease Control and Prevention, Effective interventions, HIV Prevention that works accessed at <https://effectiveinterventions.cdc.gov/en/highimpactprevention/PublicHealth-Strategies.aspx>, December 2016. [Accessed 29 December 2016]. In press.
28. Gardner LI, Metsch LR, Anderson-Mahoney P, Loughlin AM, del Rio C, Strathdee S, *et al.*, Antiretroviral Treatment and Access Study Group. Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care. *AIDS* 2005; 19:423–431.
29. Camacho-Gonzalez AF, Wallins AT, Murray LA, Zaneta G, Madeline S, Scott G, *et al.* Key Elements for Venue-based HIV-testing and Linkage to care for Adolescent and Young Adults in Metropolitan Atlanta. Abstract Presented at the 20th International AIDS Conference, Melbourne, Australia, 2014
30. Camacho-Gonzalez AF, Wallins A, Toledo L, Murray A, Gaul Z, Sutton MY, *et al.* Risk factors for HIV transmission and barriers to HIV disclosure: metropolitan Atlanta youth perspectives. *AIDS Patient Care STDS* 2016; 30:18–24.
31. Miller WR, Stephen R. *Motivational interviewing helping people change*. Third ed. USA: The Guilford Press; 2013.
32. Biolytical Laboratories Accessed at <http://www.biolytical.com/products/instiHIV>. [Accessed 29 December 2016].
33. Dominguez Rosales R, Albar Marin MJ, Tena Garcia B, Ruiz Perez MT, Garzon Real MJ, Rosado Poveda MA, *et al.* Effectiveness of the application of therapeutic touch on weight, complications, and length of hospital stay in preterm newborns attended in a neonatal unit. *Enferm Clin* 2009; 19:11–15.
34. Maissi E, Ridge K, Treasure J, Chalder T, Roche S, Bartlett J, *et al.* Nurse-led psychological interventions to improve diabetes control: assessing competencies. *Patient Educ Couns* 2011; 84:e37–e43.
35. Madson MB, Campbell TC. Measures of fidelity in motivational enhancement: a systematic review. *J Subst Abuse Treat* 2006; 31:67–73.
36. Mugavero MJ, Davila JA, Nevin CR, Giordano TP. From access to engagement: measuring retention in outpatient HIV clinical care. *AIDS Patient Care STDS* 2010; 24:607–613.
37. National HIV/AIDS Strategy for the United States Updated to 2020; The White House 2015, accessed at <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>. [Accessed 18 December 2016].
38. Sprague C, Simon SE. Understanding HIV care delays in the US South and the role of the social-level in HIV care engagement/retention: a qualitative study. *Int J Equity Health* 2014; 13:28.
39. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, *et al.*, HPTN 052 Study Team. Antiretroviral therapy for the prevention of HIV-1 transmission. *N Engl J Med* 2016; 375:830–839.
40. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, *et al.*, HPTN 052 Study Team. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011; 365:493–505.
41. Shah M, Risher K, Berry SA, Dowdy DW. The epidemiologic and economic impact of improving HIV testing, linkage, and retention in care in the United States. *Clin Infect Dis* 2016; 62:220–229.

DEXIS: Demonstrating Expanded Interventional Surveillance:
Towards Ending the HIV Epidemic in Philadelphia

**DEXIS: *Demonstrating Expanded
Interventional Surveillance***

Akash Desai
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desai@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance:
Towards Ending the HIV Epidemic in Philadelphia

Purpose:

DEXIS addresses each of the national HIV prevention goals of reducing new HIV infections, increasing access to care, and reducing HIV-related disparities and health inequities. The project will provide for an in-depth evaluation of sentinel cases of HIV transmission and pursue organizational, system- and community-level interventions to prevent future transmissions.

Akash Desai
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desai@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance: Towards Ending the HIV Epidemic in Philadelphia

Through DEXIS, we will:

- Develop a cohort review of recent HIV infections to identify missed opportunities for HIV prevention
- Implement individual-level interventions among the cohort members and their risk networks to improve HIV Prevention and Care Continuum outcomes
- Develop and implement action steps through the cohort review process to close system-level gaps in HIV prevention

Priority Populations:

- Men of color who have sex with men
- Youth ages 13 to 24
- Transgender persons who have sex with men

Akash Desal
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desal@phila.gov



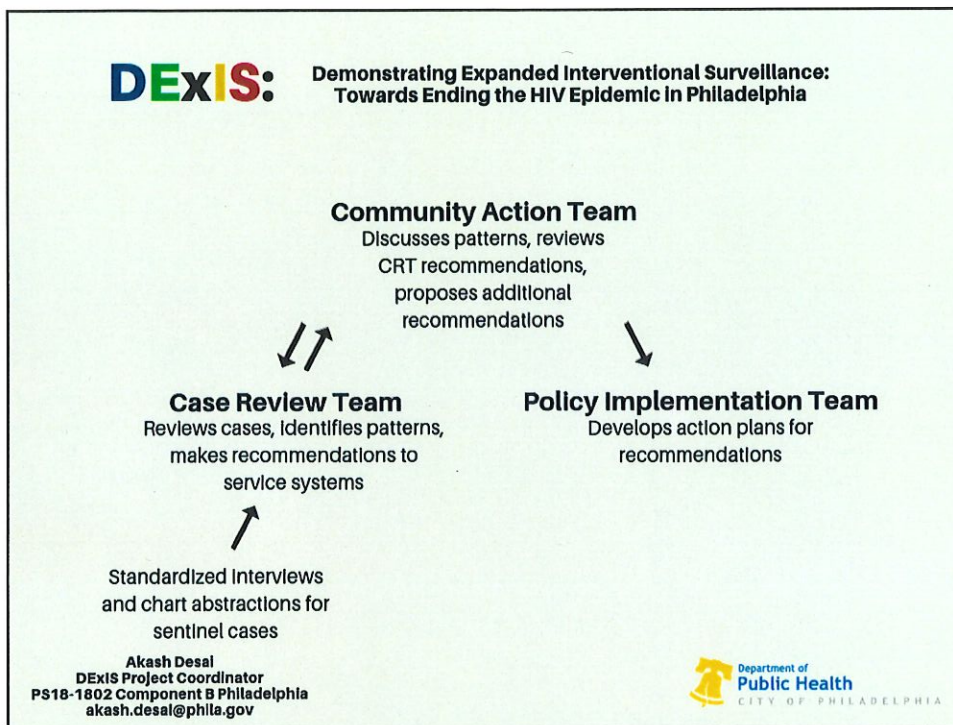
DEXIS: Demonstrating Expanded Interventional Surveillance: Towards Ending the HIV Epidemic in Philadelphia

Surveillance-based identification of cases (Stage 0 infections, members of identified groups of related infections) among priority populations (MSM of color, youth ages 13 to 24, transgender persons who have sex with men)



Akash Desal
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desal@phila.gov





DEXIS: Demonstrating Expanded Interventional Surveillance: Towards Ending the HIV Epidemic in Philadelphia

Domains for Interview

- HIV Testing
 - *Hypothesis:* Most people are aware HIV testing exists but may not know how to access it, may not be able to, or may not feel comfortable using it.
- HIV Prevention
 - *Hypothesis:* Across the board, messages for U=U, condoms, PrEP, and syringes do not resonate with populations of priority and the threshold to accessing services is too high.
- PrEP and PEP *← knowledge / use*
- Insurance Status
- Access to Primary Medical Care
- Social Experiences
- Stigma
 - *Hypothesis:* Internalized and externalized stigma negatively impact access and uptake of HIV prevention services.
- Substance Use
- Mental Health
- Exposure to Justice System
- Housing Status
- Experiences with the Philadelphia Department of Public Health

Akash Desal
 DEXIS Project Coordinator
 PS18-1802 Component B Philadelphia
 akash.desal@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance: Towards Ending the HIV Epidemic in Philadelphia

Fields for Chart Abstraction

- Demographics
- Sexual Orientation and Gender Identity (SOGI)
- STI Testing
- HIV Testing
- Insurance Status
- Substance Use
- Mental Health
- Other Medications
- Comorbidities

Sources of Records

- Partner Services
- Testing and Linkage to Care Sites
- Medical Facilities (Inpatient, ED, urgent care)

Akash Desal
 DEXIS Project Coordinator
 PS18-1802 Component B Philadelphia
 akash.desal@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance:
Towards Ending the HIV Epidemic in Philadelphia

Meeting Guidelines

- Case Review Team meetings will be safe and non-judgmental
- Members will listen respectfully
- Be tough on Ideas, not team members
- Ensure that every participant has the opportunity to speak, and that only one voice is speaking at a time
- Use the nominal group process to resolve difficult decisions about prioritizing recommendations or actions
- Not tolerate the use of stereotypes and prejudicial comments
- Take responsibility
- Assume positive intent
- Begin and end meeting on time
- Members will allow the facilitator to guide
- Members will stay on track and promote time management

Akash Desai
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desai@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance:
Towards Ending the HIV Epidemic in Philadelphia

Pledge of Confidentiality

All DEXIS information and Case Review Team (CRT) discussions are to be regarded as confidential. As a team member, you are agreeing to:

- Protect and secure information in your possession.
- Not discuss or share information about individual cases and the proceedings of the CRT outside the CRT meetings now or at any time in the future.
- Not photocopy or share information about the DEXIS case review process, case review findings, or any other confidential aspect of the DEXIS program now or at any time in the future.
- Refrain from naming individuals (including family members, providers or institutions) or sharing anecdotal information about them during CRT meetings now or at any time in the future.

Akash Desai
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desai@phila.gov



DEXIS: Demonstrating Expanded Interventional Surveillance:
Towards Ending the HIV Epidemic in Philadelphia

DEXIS Leadership Team

AIDS Activities Coordinating Office

- Coleman Terrell, *Director*
- Kathleen Brady, MD, *Medical Director/Medical Epidemiologist*
- Evelyn Torres, MBA, *Program Implementation Administrator*
- Caitlin Conyngham, *Senior HIV Prevention Services Coordinator*
- Melissa Miller, MPH, *Epidemiologist III/Molecular HIV Surveillance Coordinator*
- Champagnae Smith, MPH, *Core Surveillance Epidemiologist*
- Akash Desai, *DEXIS Project Coordinator*
- Bikim Brown, *DEXIS Chart Abstractor*
- Margaret Nelson, *Philly Forward Intern*

Division of Disease Control—Partner Services

Akash Desai
DEXIS Project Coordinator
PS18-1802 Component B Philadelphia
akash.desai@phila.gov



