



Utilizing Community Based Participatory Research Methods in Black/African American and Hispanic/Latinx Communities in the US: The CDC Minority HIV Research Initiative (MARI-Round 4)

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Abstract

The Centers for Disease Control and Prevention Minority HIV Research Initiative (MARI) funded 8 investigators in 2016 to develop HIV prevention and treatment interventions in highly affected communities. We describe MARI studies who used community-based participatory research methods to inform the development of interventions in Black/African American and Hispanic/Latinx communities focused on sexual minority men (SMM) or heterosexual populations. Each study implemented best practice strategies for engaging with communities, informing recruitment strategies, navigating through the impacts of COVID-19, and disseminating findings. Best practice strategies common to all MARI studies included establishing community advisory boards, engaging community members in all stages of HIV research, and integrating technology to sustain interventions during the COVID-19 pandemic. Implementing community-informed approaches is crucial to intervention uptake and long-term sustainability in communities of color. MARI investigators' research studies provide a framework for developing effective programs tailored to reducing HIV-related racial/ethnic disparities.

Keywords Community-based participatory research · HIV · Disparities · COVID-19

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Introduction

In the United States (U.S.) HIV continues to disproportionately affect Black or African American (hereafter referred to as Black) and Hispanic/Latinx persons, who accounted for 42% and 27% of all HIV diagnoses in 2020, respectively [1]. Subgroups of racial/ethnic minorities that are particularly affected include gay, bisexual and other sexual minority men (hereafter referred to as SMM [2]), cisgender women, transgender persons, and younger persons. Although pre-exposure prophylaxis (PrEP) [3] and antiretroviral treatment (ART) are effective in reducing new infections, uptake of these biomedical interventions remains lower among Black and Hispanic/Latinx persons than their White counterparts [4–6]. To End the HIV Epidemic in the U.S. (EHE) [7], the Department of Health and Human Services (DHHS) outlined four strategic pillars to reduce the incidence of HIV by 90% by 2030: (1) diagnose all individuals with HIV as early as possible after infection; (2) treat HIV infection rapidly and effectively to achieve sustained viral suppression; (3) prevent traditionally marginalized

individuals from acquiring HIV infection; and (4) detect and respond to emerging clusters of HIV infection. Most recently, DHHS released the National HIV/AIDS Strategy 2022–2025 (NHAS), that includes the goals of reducing HIV-related disparities and health inequities and achieving integrated and coordinated efforts to address HIV among all collaborators [8]. Strategies and activities aligned with EHE pillars and NHAS that eliminate racial/ethnic disparities and are tailored toward Black and Hispanic/Latinx communities are urgently needed.

To counteract HIV-related disparities and increase HIV prevention and treatment research in the most affected communities, in 2003 the Centers for Disease Control and Prevention (CDC) initiated MARI (Minority HIV Research Initiative), a cooperative agreement to fund research in communities of color disproportionately affected by HIV [9; 10]. MARI has launched the careers of Black and Hispanic/Latinx early career investigators who have dedicated their careers to community engagement work but are often underrepresented in the field of public health [11;12] and have historically received fewer funding opportunities compared to their White peers [13]. To date, the CDC has funded 42 investigators since 2003 to conduct HIV prevention and treatment research and develop interventions acceptable for and sustainable in communities of color. Many MARI investigators have used community-based participatory research (CBPR) methods, an approach that is action and solution-oriented, promotes collaboration between researchers and the community, and applies the use of scientific methodology to address health priorities in communities [14–16]. CBPR unites the field of public health professionals (e.g., academic institutions, federal, state, and local health departments, community-based organizations [CBOs]), directly with the local community, and ensures the community is involved in all stages of research. CBPR also translates science into practice after the development and implementation of effective interventions by disseminating findings to community for long-term use and sustainability [16].

CBPR methods are centered on eight principles: (1) recognizing the community as a unit of identity, (2) building on the strengths and resources of the community, (3) facilitating collaboration in all phases of research, (4) integrating knowledge and action that mutually benefits all partners, (5) promoting co-learning and empowerment to address social inequalities, (6) employing a cyclical and iterative process to develop and maintain community/research partnerships, (7) addressing health from both a positive and ecological perspective, and (8) disseminating knowledge and findings to and by all involved partners [14]. The use of CBPR methods was not a requirement for MARI funding by the CDC; however, many of our MARI investigators organically used CBPR approaches, in some capacity, to develop

their culturally tailored interventions for their communities. Community was defined by the MARI investigator, varied across sites, and was based on the populations traditionally marginalized with HIV (e.g., geographic regions, racial/ethnic groups, and/or populations of certain identities [SMM, young cisgender heterosexual Black and Hispanic/Latinx populations]).

In this paper, we outline the CBPR strategies used by MARI investigators funded during the 2016–2020 MARI cycle (MARI-Round 4) to (1) build relationships with local communities and inform the development of their culturally tailored interventions, (2) boost and diversify recruitment of study participants within communities of color into their studies, (3) navigate impacts of COVID-19 on HIV research in communities of color, and (4) disseminate and sustain research findings after completion of research. The strategies shared are from their personal experiences working in communities of color and using community-informed approaches in Black and Hispanic/Latinx communities.

Overview of MARI Round 4 Studies Developed for Black and Hispanic/Latinx Communities

In 2016, eight MARI investigators received CDC funding to develop HIV prevention and treatment studies among racial/ethnic minority populations. We present seven of the eight studies of investigators who participated in the MARI program from 2016 to 2020 (one MARI investigator exited the program early due to a career opportunity). All studies [17–22] were investigator-initiated, then reviewed and approved by the CDC prior to implementation. Their key features, including design, prioritized populations, and partnerships are summarized in Table 1.

Of the seven studies, six [17–19; 21–23] (86%) focused on SMM populations, one [20] (14%) focused on heterosexual populations; four [18–21] (57%) focused on young populations (ranging from aged 16 to 29 years); and four [17; 19; 21; 23] (57%) included populations of persons with HIV infection. All studies prioritized inclusion of Black and/or Hispanic/Latinx persons, with five studies (71%) focusing on Black persons and four studies (57%) focusing on Hispanic/Latinx persons. Additionally, all studies were within geographical areas with high HIV prevalence rates and, more specifically, six studies (86%) recruited from EHE prioritized jurisdictions with elevated HIV incidence rates [7] (i.e., Baltimore City, Maryland; Bronx County, New York; Fulton and DeKalb Counties, Georgia; Jackson, Mississippi; New Orleans and East Baton Rouge Parishes, Louisiana; Philadelphia County, Pennsylvania; and San Juan, Puerto Rico).

Table 1 Projects Developed by CDC Minority HIV Research Initiative Investigators, 2016–2020

| Investigator & Institution | Title of Project | Overview of Project | Prioritized Population & Location | Key Partners & Roles |
|---|---|---|---|--|
| Dustin Duncan, ScD, ScM – Columbia University | Impact of Neighborhoods and Networks on HIV Prevention and Care among Black Sexual Minority Men (SMM) in the Deep South – The Networks and Neighborhoods Project [17] | N2 (Networks and Neighborhoods) was a multisite cohort project that examined cross-sectional and longitudinal relationships between neighborhood-level factors using global positioning system (GPS)-defined activity spaces and social and sexual network characteristics on HIV prevention and care behaviors. The N2 Study utilized community-based organizations (CBOs) to direct recruitment efforts in locations such as popular social events, venues and use of geo-social networking apps often used by the prioritized study population. | Black SMM in Jackson, MS, New Orleans, LA and Baton Rouge, LA | <p><i>Community Advisory Board</i></p> <ul style="list-style-type: none"> Involved in community-based recruitment activities (e.g., events, venues, apps) and recruitment through service projects. <p><i>My Brother's Keeper Inc.</i></p> <ul style="list-style-type: none"> Involved in community-based recruitment activities (e.g., events, venues, apps) and recruitment through service projects. <p><i>Brotherhood Inc.</i></p> <ul style="list-style-type: none"> Involved in community-based recruitment activities (e.g., events, venues, apps) and recruitment through service projects. <p><i>Capital Area Reentry Program, Inc. (CARP)</i></p> <ul style="list-style-type: none"> Involved in community-based recruitment activities (e.g., events, venues, apps) and recruitment through service projects. |
| Errol Fields, MD, PhD, MPH – Johns Hopkins | Targeted PrEP Implementation: Interrupting HIV Transmission among Young Black Sexual Minority Men (SMM) – The Safe Spaces 4 Sexual Health (SS4SH) Project [18] | The SS4SH project identified high risk sex partner meeting venues connected to ongoing HIV transmission networks and identified facilitators and barriers to accessing and achieving PrEP uptake among young Black SMM who attended these venues. Using an existing community advisory board (CAB), meetings were held regularly to develop recruitment material tailored toward online venues to recruit study participants. | Black SMM in Baltimore City, MD | <p><i>Community Advisory Board</i></p> <ul style="list-style-type: none"> Assisted with the development of recruitment materials. <p><i>Baltimore City Health Department</i></p> <ul style="list-style-type: none"> Shared HIV/Sexually Transmitted Infection (STI) surveillance data. Partnered in the development of Mobile Van, HIV/STI Testing Intervention Using Online Outreach to Reach disproportionately affected SMM. Covered the cost of HIV/STI test kits and the processing of HIV confirmatory and STI testing. <p><i>Baltimore in Conversation and the Social Marketing and Community Engagement program</i></p> <ul style="list-style-type: none"> Assisted with developing and convening the initial community advisory board. <p><i>Building Healthy Online Communities</i></p> <ul style="list-style-type: none"> Facilitated relationships with geo-social networking apps and development/implementation of geo-targeted advertisements on these sites. |
| Sophia Hussen, MD, MPH – Emory University | Social Capital and Engagement in Care Among Young Black Sexual Minority Men (SMM) Living with HIV – The B6 Project [19] | The B6 project is a social capital intervention for young Black SMM with HIV to enhance social capital as a strategy to improving engagement in care. B6 project staff organized a youth advisory board (YAB) of young Black SMM aged 18–29 years. The YAB was recruited through CBOs, Facebook groups, and had input in all stages of the study development (i.e., recruitment tools, intervention framework). A CAB was also formed of CBO staff and other HIV community leaders who also provided input in the development and refinement of the intervention. | Black SMM in Atlanta, GA | <p><i>Community Advisory Board</i></p> <ul style="list-style-type: none"> Assisted with recruitment and gave feedback on our various research study tools (in-depth interview [IDI] guides, etc.), recruitment strategies, and intervention content. <p><i>THRIVE Support Services</i></p> <ul style="list-style-type: none"> Assisted with recruitment and gave feedback on our various research study tools (IDI guides, etc.), recruitment strategies, and intervention content. <p><i>He is Valuable</i></p> <ul style="list-style-type: none"> Assisted with recruitment and gave feedback on our various research study tools (IDI guides, etc.), recruitment strategies, and intervention content. <p><i>AID Atlanta</i></p> <ul style="list-style-type: none"> Assisted with recruitment and gave feedback on our various research study tools (IDI guides, etc.), recruitment strategies, and intervention content. |

Table 1 (continued)

| Investigator & Institution | Title of Project | Overview of Project | Prioritized Population & Location | Key Partners & Roles |
|--|--|---|--|--|
| Yzette Lanier, PhD, MS – New York University | Development of a Couples-Focused HIV Behavioral Intervention for High-Risk Heterosexually-Identified Black and Latino Youth and Their Romantic Partners – The Project Youth Engaging in Health and Safe Sex [20] | Project YESS (Youth Engaging in Health and Safe Sex) assessed the feasibility of engaging young Black and Latinx heterosexual couples in HIV prevention research. Project YESS specifically focused on how individual and relationship factors influence the uptake of HIV prevention methods, individually and in combination to prevent new HIV/STI infections among Black and Latinx adolescents and young adults (AYAs). Findings from the study will be used to design a scalable, culturally tailored, and age appropriate couples-focused HIV behavioral intervention to strengthen romantic relationships and increase uptake of combination HIV prevention methods. Community members navigated the Project YESS study team to the best locations for street intercept, CBOs hosting recruitment events, and community partner referrals to bolster recruitment. | Black and Hispanic/Latinx Heterosexual Youth & Young Adults in New York City, NY | <i>Community Advisory Board, Clinics, Community Based Organizations, youth-serving organizations, schools, etc.</i> • Contributions included: sharing project info at their sites (physical or online), recruiting individuals, linkage to other community partners, serving on community advisory boards and providing feedback on study goals and survey/interview items. |
| Souhail Malavé-Rivera, PhD – University of Puerto Rico | Combined Strategies to Improve Health Outcomes among HIV-positive Young Sexual Minority Men (SMM) in Puerto Rico – The Contactos Project [21] | Contactos is a group-level stigma-management intervention for HIV-positive young SMM in Puerto Rico. The intervention aimed to reduce HIV and gay stigma, increase social support, and improve access, retention, and adherence to care. Community partners supported recruitment efforts by placing recruitment flyers in clinic waiting areas and referring potential participants to us for screening. | Hispanic/Latino young SMM in San Juan, Puerto Rico | <i>Community Advisory Board</i> • Assisted with advertisements and recruitment of study participants. <i>Puerto Rico Community Network for Clinical Services, Research and Health Advancement, Inc. (PRCONCRA) and Coaí, Inc.</i> • Assisted with advertisements and recruitment of study participants. They also provided space in their facilities to conduct data collection procedures (i.e., focus groups and in-person intervention groups). <i>Centro ARARAT, Inc. and The Latin American Center for Sexually Transmitted Diseases (CLETS, by its name in Spanish)</i> • Assisted with advertisements and recruitment of study participants. |

Table 1 (continued)

| Investigator & Institution | Title of Project | Overview of Project | Prioritized Population & Location | Key Partners & Roles |
|---|---|--|---|--|
| Omar Martinez, JD, MS, MPH – Temple University | A Couple-based HIV Prevention Intervention to Promote HIV Protection among Latino Male Couples – The Connecting Latinos en Parejas Project [22] | Connecting Latinos en Parejas (CLP) is a couple-based bio-behavioral HIV prevention and treatment intervention for Latino Men and their same-sex partners to increase protected anal sex acts with their main partners. A CAB consisting of community members guided all stages of research process including recruitment and retention approaches, intervention adaptation, and development of assessment measures. | Hispanic/Latino Sexual Minority Men (SMM) Couples in Philadelphia, PA | <p><i>Community Advisory Board</i></p> <ul style="list-style-type: none"> • Assisted with development of recruitment materials and intervention delivery. <p><i>GALAEI: Latinx LGBT organization</i></p> <ul style="list-style-type: none"> • Assisted with recruitment and intervention delivery. <p><i>Philadelphia Department of Health</i></p> <ul style="list-style-type: none"> • Recruitment from City of Philadelphia Health Centers and forums at the health department with department staff to report on screening data (e.g., mental health, childhood sexual abuse, HIV sexual risk behaviors) and progress on study. <p><i>Gay Bars (i.e., Tavern on Camac, U Bar, Woody's)</i></p> <ul style="list-style-type: none"> • Recruitment partners <p>The following community partners roles included recruitment, engagement of participants, and/or representatives or worked at these organizations:</p> <ul style="list-style-type: none"> • William Way LGBT Community Center • Wellness Resource Center at Temple University • Action Wellness • TPAC • Hispanic Family Center of Southern New Jersey • Hyacinth AIDS Foundation • COLOURS |
| Jacob van den Berg, PhD, MS, MPH – Brown University | Reaching Black/African American and Hispanic/Latino Sexual Minority Men (SMM) through Social Media about Treatment as Prevention (TasP) and Pre-Exposure Prophylaxis [23] | The study developed and evaluated an eHealth intervention with information about TasP (Undetectable = Untransmittable) and PrEP to decrease new HIV infections among Black and Latino SMM with or without HIV. A CAB comprised of Black and Latino SMM meet several times a year in-person or virtually to provide feedback on participant recruitment and study-related materials (e.g., questionnaires). | Black and Hispanic/Latino SMM living with or without HIV in New England | <p>The following local agencies and groups assisted with participant recruitment:</p> <ul style="list-style-type: none"> • AIDS Project Rhode Island • AIDS Care Ocean State • Youth Pride, Inc. • Men's Health Initiative at Brown University • Multicultural AIDS Coalition • New England Alliance for Gay and Bisexual Men's Health <p>The following partners assisted with participant recruitment, dissemination of findings and provided feedback through the project period:</p> <p>Community Advisory Board</p> <p>Educational Programs</p> <ul style="list-style-type: none"> • Brown University AIDS Program • New England AIDS Education & Training Center • New England HIV Implementation Science Network <p>Research Centers</p> <ul style="list-style-type: none"> • Providence/Boston Center for AIDS Research • Yale University Center for Interdisciplinary Research on AIDS • Center for Alcohol and Addiction Studies at Brown University <p>Hospital</p> <ul style="list-style-type: none"> • The Miriam Hospital HIV & STD Clinics |

Relationships: Building and Strengthening Relationships Through Community Engagement

Community engagement is a key principle of CBPR, which ensures the perspectives and priorities of the community are prioritized in research. Community members hold a wealth of knowledge and expertise that is vital in the formative stages of public health research. They are able to identify the public health problem for their communities

and the populations who should be prioritized. Furthermore, and most importantly, community engagement yields the opportunity for non-researchers to contribute to the development of effective and sustainable interventions within their community. Once trusted relationships are formed, the community members are vital resources often serving on community advisory boards (CABs) to guide the development and implementation of novel and culturally tailored interventions. CABs include people from the local community who not only understand their communities in a

way that investigators may not but are also committed to improving health outcomes for the people who live in their communities. Many of our MARI investigators used formative work with community partners and organizations to inform the development of their MARI studies (Table 1). Our MARI investigators then developed or utilized existing CABs (and/or youth advisory boards [YABs]), specifically to provide input and feedback throughout the research

Table 2 Summary of Strategies Utilized by MARI Round 4 Investigators to Build and Strengthen Relationships, Inform Recruitment, and Navigate the Impacts of the COVID-19 pandemic on Community-Based Participatory Research Methods in Communities of Color
Strategies to Build and Strengthen Relationships through Community Engagement

1. Building trusting relationships with local and regional community-based organizations (CBOs) and other community partners and then inviting key partners to serve on Community Advisory Boards (CABs) or Youth Advisor Boards (YABs) to give them a “seat at the table”.
2. Forming or engaging with existing CABs or YABs representative of the prioritized population and compensating members for their time.
3. Integrating qualitative methods into both formative work and program evaluation to incorporate the perspectives and voices of the community.
4. Ensuring the CABs role is equitable in decision making and respecting partners opinions and feedback on study design and recruitment.

Strategies to Inform Recruitment in Communities of Color

1. Utilizing Community Advisory Boards (CABs) and other community partners to assist in creating study recruitment materials including culturally and linguistically appropriate language, creating diverse images on recruitment materials, and avoiding stigmatizing language and images.
2. Involving CABs and other community partners in organizing culturally relevant events to assist with recruitment and having partners wear study paraphernalia at community events to increase study visibility.
3. Utilizing online recruitment networks (e.g., Facebook, Twitter, Instagram, Grindr)
5. For studies focusing on couples, using dyadic recruitment and screening techniques.
6. Recruiting in-person during days/times of the week and locations as recommended by community partners and utilizing street intercept recruitment methods.
7. Leveraging the partnerships built with community members to receive direct participant referrals to their studies.

Strategies to Navigate the Impacts of the COVID-19 pandemic on Community-Based Participatory Research Methods for HIV Research in Communities of Color

1. Shifting from in-person to online social networks for recruitment and recruiting from past research studies.
2. Shifting data collection and delivery of interventions from in-person to online platforms and ensuring flexibility regarding facilitation methods (e.g., Zoom, Qualtrics, email, phone).
3. Maintaining persistence with online social networks to achieve recruitment goals although competitive and challenging with increased number of online HIV studies during COVID-19 pandemic.

process. CABs were comprised of various community members including staff from CBOs, local residents who identified with the study population, and other local community partners. The majority of MARI investigators either lived in the community where their study was conducted and/or shared identities with the study population (e.g., cis-gender Black or Latinx SMM) which facilitated knowing the key community members to work with. Fortunately, our MARI investigators are well rooted in their communities and best identified their key community members by attending community events, introductions by other community researchers, and/or received referrals of trusted community persons from their study population. Here, we share additional details regarding community engagement strategies implemented by our MARI investigators throughout their research and common strategies are summarized in Table 2.

Duncan et al. [17] developed a CAB to leverage their expertise on recruitment strategies of Black SMM and building relationships with community partners. All CBOs associated with the project were Black operated and one CBO was founded by a Black SMM who had a deep commitment to the project, his community, and reducing disparities in the region.

Fields et al. [18] worked with a local CAB to solicit feedback on advertisement and recruiting strategies for Black SMM. Fields et al. found that integrating qualitative methods, including focus groups and in-depth interviews, in both formative work and program evaluation can be an effective strategy for ensuring the incorporation of community voices and perspective. Qualitative methods elevate community perspectives to data and its dissemination for public action, a critical currency in research.

Hussen et al. [19] created a separate CAB and YAB for their youth-focused intervention among Black SMM. The CAB, comprised of CBO staff and other key community leaders, met approximately quarterly and was compensated with gift cards. YAB members were hired through the university as research assistants and paid an hourly rate, as a strategy for increasing bilateral investment in the partnership and building resumes of the YAB members. Finally, Hussen et al. worked with CBOs to facilitate linkage to HIV care and mental health services for participants where needed.

Lanier et al. [20] built relationships with local youth-serving community organizations/agencies. Lanier et al. then invited these local partners to serve as CAB members. This allowed partners to have a “seat at the table”, provide guidance and direction to the project (e.g., wordsmithing recruitment materials to get young people’s attention, incentives) and become invested in the success of the project.

Malavé-Rivera et al. [21] met with community partners prior to implementing their study to receive feedback on

how to identify and overcome potential threats for successful implementation of research. The team also established clear and realistic expectations about the goals of their research and collaboration with partners.

Martinez et al. [22] utilized their CAB to guide the development of recruitment materials and intervention content developed for Hispanic/Latinx SMM. The CAB's role was equitable in decision making and built on a foundation of trust and mutual respect. Importantly, CAB members were paid for their time and commitment to the study.

van den Berg et al. [23] worked with local and regional CBOs on HIV prevention and treatment efforts and fostered new and existing relationships with these CBOs. The study's CAB also provided invaluable feedback on recruitment materials, offered suggestions on additional local venues to recruit Black and Hispanic/Latinx SMM, and provided new ideas for recruitment materials (e.g., bar coasters).

Leveraging: Utilizing Communities to Inform Recruitment Strategies in Communities of Color

Persons of color are more likely to hold a long-standing mistrust of medical professionals and enrollment in clinical studies than White persons, in part due to historical injustices and prior negative experiences of their communities with research and health care systems [24]. Medical mistrust contributes to the challenges encountered enrolling persons of color into interventional studies, although representation, especially by Black and Hispanic/Latinx persons, is most needed to reduce HIV-related disparities and advance the goals of EHE in the U.S. Voices of the CAB and community members can help inform strategies for developing recruitment materials and recruiting prioritized populations into studies. We specifically highlight the strategies our MARI investigators and CABs developed and implemented to engage and successfully recruit Black and Hispanic/Latinx persons into their studies. A summary of these strategies is also provided in Table 2. Figure 1 also includes the recruitment materials developed by our MARI investigators that were informed by their CABs.

The CAB for the Duncan et al. [17] study assisted with organizing culturally relevant events (e.g., costume party) to recruit Black SMM participants and provided input on the study methods including research protocols. The CAB also increased the study's visibility in the community by increasing awareness of the study with other community members, wearing study paraphernalia at events, and passing out study-related gear such as water bottles and t-shirts at special events.

The CAB for Fields et al. [18] provided feedback on recruitment materials and input on the study images. The CAB felt that couples depicted in the ads should feature

Black gay couples to make the ads more compelling, providing insight that it was rare to see images of two Black men together in SMM-focused ads. Fields et al. [18] used the CAB's feedback and made iterative changes including updating recruitment ads (e.g., flyers, Grindr, Adam4Adam), adding incentivized referrals, and creating and posting a video of a mock study visit to the study website featuring a well-known member of the local Black gay community in the role of a study participant. Fields et al. [18] also used real-time participant feedback, initially collected anecdotally and later collected via in-depth interviews off-site after the participant experience on the van, to improve their recruitment strategy (e.g., leverage existing social networks of SMM, avoid stigmatizing images) and operating procedures that increased participant satisfaction (provided a video of the HIV testing and survey process with a mock participant to alleviate participant concerns).

The YAB for the Hussen et. [19] study met twice monthly to provide informed feedback for recruitment strategies (e.g., encouraged use of advertising, 'snowball' recruitment, and engaging previous study participants for promotion). The YAB and various partner CBOs referred potential participants and provided direct referrals for Black SMM participants for both the formative (pilot) research and the intervention.

Lanier et al. [20] community partners assisted with creating study flyers in English and Spanish and provided recommendations on days and times of the week and locations to recruit. For studies focusing on Black and Hispanic/Latinx heterosexual couples, Lanier et al. found it was imperative for dyadic recruitment and screening to occur and that street intercept was most successful [25].

Malavé-Rivera et al. [21] built a relationship with community health clinics that provided direct services to Hispanic/Latinx SMM that could benefit from their research. Study staff met in-person with partner clinics' personnel to discuss best strategies (i.e., having diverse images printed on recruitment materials), and pre-COVID, having study staff recruiters on-site. Direct communication with partner clinics allowed staff to feel comfortable having their patients participate in the study and answer questions from potential referrals.

Martinez et al. [22] actively established online recruitment networks (e.g., Facebook, Twitter and Instagram) and posted materials in various settings (e.g., health fairs, Pride events) to recruit Hispanic/Latinx SMM couples. CAB members completed questionnaires and engaged in discussions of how to develop culturally and linguistically appropriate recruitment materials and refine intervention content (e.g., colloquial language, images on recruitment material, avoiding stigmatizing language).

Fig. 1 – Examples of recruitment materials from MARI investigator studies developed with feedback by their local Community Advisory Boards. (a) Fields et al. recruitment flyer for the SS4SH (Safe Spaces 4 Sexual Health) study. (b) Hussen et al. B6 Study. (c) Lanier et al. Project YESS (Youth Engaging in Safe Sex) Study. (d) Martinez et al. Connecting Latinos En Parajea Study. (e) van den Berg et al. Project HIMM study



van den Berg et al. [23] implemented community partners’ recommendations by using a mixture of in-person, online, and community referrals to recruit and engage communities of Black and Hispanic/Latinx SMM. Online recruitment (e.g., Facebook, Instagram, Twitter) was most successful in recruiting participants compared to community-based referrals and in-person recruitment. Despite social media ads being costly, they were highly effective in recruiting study

participants in the targeted areas of New England. Secondly, when presenting the study at relevant CBOs, partners would disseminate information to their clients which was also effective for recruiting additional participants.

Navigating: Impacts of the COVID-19 Pandemic on CBPR Methods for HIV Research in Communities of Color

Nearing the end of MARI investigators' studies, the emergence of the COVID-19 pandemic caused rippled effects on research and delivery of HIV prevention and treatment services [26]. During the early stages of the COVID-19 pandemic, when many states enacted stay at home orders, engagement with community partners was limited to non-existent. Keeping partners engaged was even more difficult during this time, given many agencies suspended in-person activities, were closed, or overwhelmed trying to navigate how to operate and serve their populations during the COVID-19 pandemic. As a result, partners were less responsive despite communication attempts, leaving MARI investigators with little access to their community partners to assist with adaptations of their studies. Thus, many MARI investigators had to innovate, become even more agile, and critically pivot from in-person to online recruitment, data collection, and delivery of their interventions without any structured community engagement. Although, a pandemic requiring social distancing and isolation is not a frequent occurrence, sharing the best practices and strategies utilized by the MARI investigators during this challenging period may benefit CBPR methodological approaches during future public health emergencies. A summary of these strategies is also provided in Table 2.

MARI investigators were in varying stages of their studies (i.e., recruitment, data collection, participant follow-up, analyzing results) and had to navigate differently to minimize disruptions to their research studies. For example, Duncan et al. [17], temporarily halted study operations until participant follow-up could safely resume in-person with social distancing restrictions. Other MARI investigators, such as, Fields et al. [18], Lanier et al. [20], and van den Berg et al. [23], had to shift or rely more heavily on online social networks and sites (i.e., Facebook, Twitter, Instagram) for recruitment. They encountered significant study recruitment challenges competing against the increased number of HIV and other researchers who had also moved their participant recruitment activities online. Persistence with the online social networks and when possible, recruiting from past research studies was key to achieving recruitment goals. Lastly, some MARI investigators, such as, Fields et al. [18], Lanier et al. [20], Malavé-Rivera et al. [21], and Martinez et al. [22], had to partially shift their data collection and/or intervention delivery to online platforms. Participants had to be flexible regarding facilitation (e.g., Zoom, Qualtrics, email, phone) and both MARI investigators and participants had to quickly become knowledgeable and comfortable with the use of online platforms.

Engaging the community in all stages of research is an important principle in CBPR, but when community engagement is limited or not possible, we present viable strategies that can be implemented during public health emergencies to ensure research moves forward. These strategies can also be useful for future intervention recruitment and delivery as the overall use of technology increased since the emergence of COVID-19. For example, younger minority populations aged 16–35 years acquire HIV at disproportionate rates compared to older populations [27], so utilizing online recruitment mechanisms (e.g., social media) enhances the potential of recruiting younger minority populations into HIV prevention and treatment interventions. Furthermore, modalities such as eHealth, mHealth and telehealth to deliver HIV prevention and treatment interventions may be a preferred way to engage younger populations who are more technologically savvy. These strategies may aid in reducing structural barriers in HIV prevention and access to care (e.g., access to HIV testing; uptake and adherence to PrEP and ART) [28; 29] for individuals who may prefer a more discrete interaction due to concerns related to stigma or transportation barriers [30; 31].

Dissemination: Disseminating and Sustaining Research Findings

Despite the impacts of the COVID-19 pandemic on research, which for some necessitated changes in study methodology (including recruitment targets and follow-up timeframes), our MARI investigators successfully completed implementing their funded study activities. Dissemination is the final key principle in CBPR and aims to widely disseminate findings with and to all partners for future use and sustainability. The MARI investigators, in collaboration with their partners, disseminated research findings through presentations with community members and publishing in peer-reviewed journals [10; 17–19; 22–23; 25; 32–35]. This process was essential to ensuring their interventions are embedded within the local community and have sustaining impact on HIV prevention, care, and treatment by reducing HIV health disparities [33; 36]. Community partners have since shared findings from this research with their clients, other community partners, and are using the findings to inform their daily work and future research collaboration. The MARI investigators are also committed to long-term sustainability of their interventions within the local communities and on behalf of the partnerships they developed. Thus, all MARI investigators continue to develop research proposals with community members and seek additional funding opportunities by adapting and innovating their MARI studies for future research in their communities disproportionately affected with HIV. Specific examples include Fields et al.

[18] partnership with community members to expand their mobile van approach to include linkage to PrEP or HIV Care and Hussen et al. [19] conducting a follow-up study to convert their study to telehealth using the Zoom platform. Also, because social media (e.g., Instagram, Twitter, and Facebook) has an emerging presence in research (especially among youth and young adults), Lanier et al. [20], Martinez et al. [22], and van den Berg et al. [23], sustained active online profiles of their MARI studies as a novel way to keep community members and study populations engaged for future studies.

Discussion

During 2016–2020, the CDC-funded MARI investigators developed seven HIV prevention and treatment studies/interventions for racial/ethnic minority populations [17–23] informed by community partners. MARI studies focused on SMM populations or heterosexual populations and all studies prioritized Black and/or Hispanic/Latinx persons. All MARI investigators implemented best practice strategies for CBPR in their studies. These best practices included building community relationships and involving community partners in all stages of research (e.g., development of interventions and recruitment strategies). The investigators also demonstrated an ability to be agile and forward-thinking by transitioning to online recruitment for and implementation of their studies as needed at the onset of COVID-19 pandemic.

HIV researchers working in Black and Hispanic/Latinx communities should consider the use of community-informed approaches [33] to ensure that culturally tailored interventions that resonate with the prioritized population are developed. The MARI investigators found that creating a CAB and/or YAB, treating each partner with respect and trust, and compensating partners for their time were key to developing rapport and long-lasting partnerships, and critical to the success of their studies. Members of the CAB and YAB were from the local community and best understood the methods needed to develop and implement culturally tailored interventions (e.g., use of colloquial language that resonated with participants, how to avoid stigmatizing messaging, where to access potential participants in the community, development of recruitment materials with imagery reflective of potential participants, how to create an engaging intervention to increase retention, leveraging social networking sites including Grindr, Facebook, and Instagram). The MARI investigators also found clear and continuous communication with partners was necessary to keep them engaged and their voices heard. Particularly, qualitative research was vital to hear the perspectives of the community,

especially at the formative or evaluative stages of developing an intervention. Lastly, routinely sharing findings with the CAB and other community partners throughout and at the conclusion of their studies was valued and is particularly important in the dissemination and implementation cycle of public health research [37].

Successful recruitment of communities of color into HIV prevention and treatment studies and interventions requires time and patience. Historically, there are egregious examples of communities of color being neglected and treated unfairly by scientific researchers in the U.S. [38; 39]. Understanding the deep-rooted causes of medical mistrust [40] and hesitation with enrollment into scientific studies is essential to increasing representation of historically under-represented populations in future HIV and other biomedical research. Black and Hispanic/Latinx persons often experience stigma, homophobia, and racial discrimination [41–44] and some Hispanic/Latinx persons specifically experience discrimination related to immigration status [45–47]. Communicating with and involving communities of color in all stages of HIV research to identify and alleviate the key social and structural barriers that Black persons and Hispanic/Latinx persons encounter are imperative to increasing recruitment and retention in HIV research. Through the voices of the community, our MARI study findings convey the importance of avoiding stigmatizing language when recruiting [48] as well as the importance of messages being clear and simple. Applying these lessons learned and ensuring recruitment materials resonate with the prioritized population can have impactful results on recruitment and retention with communities of color in intervention studies.

Another challenge many MARI investigators faced was navigating through the impacts of the COVID-19 pandemic on their study recruitment and retention. However, because of their technological expertise, MARI investigators successfully pivoted to online community engagement (e.g., Zoom meetings) and online delivery of their interventions (e.g., Zoom and mobile health applications). Additionally, several of the MARI investigators successfully recruited persons of color using social media tools (e.g., Grindr, Instagram, Facebook, Twitter). Although the use of social media to recruit persons of color in HIV research and the use of mobile applications for delivery of interventions occurred pre-COVID [49–51], given the increased use of technology during COVID-19, it continues to show promise and should be considered when developing future research to reduce structural barriers, increase PrEP uptake [52], and ART adherence [53] which often challenge communities of color.

The MARI studies presented primarily focused on SMM and heterosexual populations. However, transgender women and other populations disproportionately affected by HIV (e.g., incarcerated populations, people who use drugs),

should be well represented in HIV research in Black and Hispanic/Latinx communities [27]. To continue to address EHE, the CDC MARI program funded five new early career investigators from 2021 to 2024 to conduct HIV prevention and treatment research in communities of color, in which two research studies are specifically focusing on these additional populations (i.e., transgender women and people with substance use disorders).

Conducting research in communities of color is critical to reducing the rates of and the racial/ethnic disparities that currently exist in HIV infections in the U.S. and its territories. Thus, initiatives such as MARI play a vital role in providing foundational support and mentoring for epidemiologic and implementation science research for communities of color by underrepresented researchers. Since its inception, the MARI initiative has been recognized as an esteemed training and mentoring program for historically underrepresented early-career scientist and many have subsequently received larger federal awards (e.g., National Institutes of Health R-series) at the conclusion of their MARI training to continue research in communities of color. The MARI program has provided researchers the ability to design innovative studies, build research capacity through epidemiologic, social and behavioral, and implementation science research methods, and foster long-standing relationships with communities that can be leveraged again for future research in communities of color. Furthermore, future research such as evaluation of the MARI studies for feasibility and acceptability and long-term uptake in communities of color can inform the development of future interventions. Lastly, CDC notice of funding opportunity announcements could include equitable funding for CBO and researcher collaborations that support CBPR.

Conclusion

Community-informed approaches are needed to reduce HIV-related disparities in communities of color. Our MARI investigators used CBPR methods to develop interventions that were culturally tailored for communities of color and these interventions continue to be adapted to support the needs of the community. The strategies and lessons learned shared by our MARI investigators are crucial to intervention uptake and long-term sustainability and should be considered by all researchers working in communities of color. As such, the MARI research initiative is filling gaps in how to address HIV in racial/ethnic minority communities and provides a framework for HIV researchers aiming to have an impact in reducing HIV-related disparities in communities of color.

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Declarations

Statements and Declarations CDC disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Authors Contribution Statement:

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