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Increasing the Meaningful Involvement of Women in HIV Cure-Related Research: A Qualitative Interview Study in the United States

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K.D. designed the study, conducted interviews, drafted the initial version of this manuscript and led data analysis.

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All authors read and approved the final manuscript.

Declaration of Interests

KD provides advisory services to Gilead Sciences, Inc. All other authors report that there are no competing interests to declare.

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Abstract

Background: Cisgender women represent over half of people living with HIV globally. However, current research efforts toward a cure for HIV focus predominantly on cisgender men. The under-representation of women in HIV cure clinical studies is particularly problematic given data suggesting that sex-dependent phenotypes limit scientific discovery.

Objective: We aimed to generate considerations to increase the meaningful involvement of women in HIV cure-related research.

Materials and Methods: We conducted in-depth interviews with biomedical researchers and community members to better understand factors that could increase the meaningful involvement of women in HIV cure clinical trials. Participants were affiliated with academia, industry, community advisory boards, and community-based organizations, and were identified using listings from the AIDS Clinical Trials Group and the Martin Delaney Collaboratories. We used conventional content analysis to analyze the qualitative data.

Results: We recruited 27 participants, of whom 11 were biomedical researchers and 16 were community members. Participants included 25 cisgender women, 1 transgender woman, and 1 cisgender man. Key considerations emerged, including the need to ensure that HIV cure studies reflect HIV epidemiologic trends and having accurate representation by sex and gender in HIV cure research. To increase the meaningful involvement of women, recommendations included instituting intentional enrollment goals, frequent and mandatory reporting on enrollment,

and incentives for sites to enroll women. Additional themes included the need for agency and self-determination, attention to lived experiences, trauma and healing, and adequate support for women (e.g., logistical, psychosocial, mental, emotional, and physical). Participants noted that women would be willing to participate in HIV cure trials, related procedures (e.g., biopsies), and analytical treatment interruptions. They also expressed a desired for women-centered and holistic clinical trial designs that account for intersectionality.

Conclusions: Our empirical inquiry extends recent calls to action to increase diversity of people involved in HIV cure research. Redressing the under-inclusion of women in HIV cure research is an urgent imperative. The entire field must mobilize and reform to achieve this goal. Meaningfully involving women across the gender spectrum in HIV cure research is needed to ensure that interventions are safe, effective, scalable, and acceptable for all people with HIV.

Keywords

Women; HIV; Clinical Trials; Participation; Meaningful Involvement; HIV Cure Research

Introduction

Cisgender women represent 54% of people living with HIV (PWH) globally, or around 20.2 million women and girls (1). An estimated 250,000 women acquired HIV in 2023, 82% of them in sub-Saharan Africa (2). Despite these statistics and the fact that cisgender women and transgender and gender diverse (TGD) people have a multi-fold increased risk of HIV acquisition in many settings (3), current research efforts toward a cure for HIV focus predominantly on cisgender men (4). Furthermore, surveillance systems and research processes continue to conflate sex and gender, not recognizing TGD people, which renders HIV data inaccurate for both cisgender and transgender people (5). For the purposes of this paper, the term women refers to all people who identify as women unless otherwise specified.

The systematic exclusion of women in HIV cure research may be traced to several factors, including strict eligibility criteria surrounding contraceptives, lack of appropriate incentives, researcher bias, and recruitment efforts that focus on male participation (6). Additionally, women face unique challenges that contribute to their under-representation including competing social and familial obligations, limited awareness about research opportunities, paternalism, and structural barriers such as stigma and systemic racism (6,13,14), among others. Policies such as the 1977 U.S. Food and Drug Administration (FDA) guidance excluding women of child-bearing potential from participating in early-phase studies were designed with protective intent, but they have left a legacy of under-representation of women in research. In 1993, the U.S. National Institute of Health (NIH) reversed the 1977 FDA policy with the Revitalization Act (15), recommending the inclusion of women and mandating that clinical trials allow for meaningful sex- and gender-based analyses. Yet it was not until 2016 that the NIH established a policy that asserted sex was a biological variable that must be factored into research designs, analyses and reporting for research involving humans and animals (16). Even with this policy in place, few studies conduct safety and efficacy analyses by sex. For example, a systematic review of 151 HIV cure

studies revealed that only 23% reported demographic data, only 6% broke down efficacy data by demographic variables, and none reported safety data by sex (17).

Approaches to HIV cure research include latency-reversal agents, immune-based approaches, cell and gene therapy, and combination therapies (18). Some efficacy trials require participants to pause antiretroviral treatment (ART) – also known as analytical treatment interruptions (ATIs) (19). Cure research has also advanced through the intensive study of rare individuals with sustained remission or cure of HIV. Of the five people cured following an intervention, only one is a woman, known as “the New York patient” (20). This woman of mixed race achieved long-term viral suppression following an ATI with no evidence of replication-competent HIV following a CCR5 Δ32 haplo-cord transplant to treat her acute myeloid leukemia (AML) (20). Two additional women were found to be exceptional elite controllers, with no replication-competent HIV in the absence of a cure intervention (a phenomenon called “spontaneous control”) (21). These cases are notable in the context of epidemiologic studies identifying a higher rate of spontaneous viral control among women (22-24). Most HIV cure strategies target host factors (e.g., immune system) instead of the virus and thus may be affected by sex-based differences (25,26). Further, there are known sex differences in HIV reservoir dynamics (27), and hormones play a role in HIV latency (6,26). In addition to biological differences, behavioral, psychosocial, and sociopolitical factors such as access to care, mental health, stigma, and resultant viral suppression (or lack of suppression) may affect the safety and efficacy of therapeutic or curative interventions for women (17,28).

The under-representation of women in clinical studies in general is particularly problematic given data suggesting that sex-dependent phenotypes limit scientific discovery (29). Moreover, a recent National Academies of Sciences, Engineering, and Medicine (NASEM) report found that lack of representation undermines trust in clinical research and compounds health disparities for women (30). The weight of data supporting sex and/or gender-based differences in HIV pathogenesis, anti-viral immune responses, and clinical outcomes (25,26,31) highlights the need to ensure the representation of *all* women in HIV cure clinical studies. Limited enrollment of women and the dearth of analyses by sex and gender can have deleterious consequences for the field of HIV cure research, by reducing generalizability of findings, masking interpretation of efficacy data in people of *all* genders, and missing relevant biological markers (6,25,26). Other reasons for including women in HIV cure trials relate to ensuring equitable access and translational scientific value (32).

It is imperative to explore how to increase the meaningful inclusion and involvement of women in HIV cure research. To better understand factors that could affect women’s participation in United States (U.S.)-based HIV cure clinical trials, we conducted qualitative interviews with researchers and community members. Further, to inform planned or ongoing HIV cure trial implementation, we explored strategies for increasing meaningful involvement of women in HIV cure studies, including studies involving an ATI.

Materials and Methods

Reflexivity

Our study team was composed of predominantly women, including socio-behavioral scientists, community members/advocates and biomedical researchers. The Principal Investigator is a White/Caucasian socio-behavioral scientist who has worked on issues of sex and gender related to HIV cure research, and she collaborated with other White/Caucasian and Black/African American socio-behavioral scientists on this study. Community members/advocates are diverse with respect to race, ethnicity, gender, age, and HIV status. Our team also involved three White/Caucasian biomedical researchers dedicated to improving women's involvement in HIV cure research. All study collaborators have a strong commitment to community-engaged research and overcoming obstacles to women's participation in HIV cure research.

Study Setting and Participants

We conducted 27 interviews with two types of participants: 1) biomedical researchers (e.g., virologists, immunologists, clinical researchers, biostatistician, etc.), and 2) community members (e.g., women with HIV and advocates for women's participation in HIV research). Participants were affiliated with academia, industry, community advisory boards (CABs), and community-based organizations (CBOs). We identified participants using listings of individuals who have advocated for increasing the involvement of women in HIV research in the AIDS Clinical Trials Group (ACTG) and the Martin Delaney Collaboratories for HIV Cure Research in recent years. We also recruited participants purposively (33) to ensure prior involvement with HIV research, including HIV cure research. To be eligible for the study, participants had to be 18 years old and older, willing to provide informed consent and to answer interview questions.

We used in-depth interviews to allow for rich discussions and narratives, including for participants to raise issues not initially included in the interview guide (34,35). Our sample demographic was primarily focused on women to help rectify the prior under-representation of women in HIV cure research.

Participant Recruitment

We sent interview invitations by email to potential participants that included the purpose of the study, the institutional review board (IRB)-approved informed consent document, a demographic form, and proposed interview guide. Participants received a Health Insurance Portability and Accountability Act (HIPAA)-compliant virtual videoconferencing weblink upon confirmation of the date and time of the interview.

Topics Covered

Following principles of community-based participatory research (CBPR) (36), we developed the interview guide in close collaboration with community members (including co-authors), some of whom are women with HIV. First, we asked participants to describe their thoughts on inclusion of women in HIV (including cure) clinical research. Topics explored included: 1) perceptions on inclusion of women in HIV (including cure) clinical research, and

2) common challenges to including women in HIV cure clinical research. Second, we asked participants to provide ways to increase meaningful participation of women in HIV (including cure) research. Topics explored included: 1) successful and less successful examples of women's participation in clinical trials, 2) steps to faciliate more equitable participation of women, 3) disaggregating scientific data by sex and gender, 4) testing interventions in women, 5) willingness to undergo invasive procedures, and 6) people of child-bearing potential. Third, we asked participants about their perceptions of HIV treatment interruptions, including: 1) women's willingness to interrupt HIV treatment, and 2) enrollment of women in ATI-inclusive trials. Finally, we explored additional considerations, including 1) logistical aspects for women, 2) transgender and gender-diverse individuals, and 3) additional suggestions.

Data Collection

From August – October 2022, the lead author (KD) conducted interviews which lasted between 30 – 75 minutes. Interviews were conducted in English and followed an IRB-approved interview guide (Table 1), with additional probing as needed. Participants from academic institutions and industry did not receive financial renumeration for their participation. For equity reasons, community members received a US $50 gift card.

Data Analysis

Interviews were transcribed verbatim using a professional service. The lead author (KD) verified transcripts for accuracy against the audio recordings prior to analysis. We used conventional content (or thematic) analysis (37) focused on inductive reasoning to analyze the qualitative data (37). We used this method because it provided a systematic yet flexible approach to review the transcripts and reduce the data to concrete themes that identified ways to meaningfully involve women in HIV cure research. Based on the consistent overlap in themes and the lack of new emergent content, we concluded that our study reached thematic saturation (38).

We compiled de-identified qualitative data into a primary document for manual coding. Transcripts were categorized by participant types, allowing us to review the range of responses received, and possible areas of convergence or divergence. We analyzed transcript data by question blocks to allow the data to remain in context. We ascribed themes and sub-themes to the data and extracted illustrative quotes. The lead author (KD) coded the interview data, and all co-authors reviewed the emergent themes and sub-themes. The codebook was inductive, and included code names, descriptions, and quotes. We then expanded and collapsed themes and sub-themes during the iterative review of the codes, and by including themes derived from existing literature. After deriving key themes and sub-themes and exemplar quotes, we wrote narrative memos to summarize the data.

Ethics Statement

The University of North Carolina at Chapel Hill (UNC-CH) IRB (study #19-0522) approved this study. Participants provided verbal consent to be interviewed and audio recorded. Interviews were confidential, and participants had the option to use a pseudonym if they preferred. Audio files were deleted upon verifying all transcripts for accuracy.

Results

Of the 27 participants, 11 were biomedical researchers and 16 were community members – of whom 11 were women living with HIV. Participants included 25 cisgender women, 1 transgender woman, and 1 cisgender man. Further, 15 participants self-identified as White/Caucasian, 7 as Black/African American, 3 as Asian, 1 as Eurasian, and 1 as African. In terms of ethnicity, 26 participants identified as non-Latinx, and 1 participant identified as Latina (Table 2). Participants (biomedical researchers and community members) were involved in the field of HIV for a mean of 23.8 years and in HIV cure research for a mean of 8.6 years.

Inclusion of Women in HIV (Including Cure) Clinical Research

Perceptions on Inclusion of Women in HIV (Including Cure) Clinical Research—Researcher and community member narratives converged on the critical importance of ensuring broad representation by sex and gender in HIV cure and clinical research. Community members commented that broad inclusion requires clear definitions around sex and gender such that gender identities can be accurately captured before diverse representation in clinical studies can be achieved.

Participants emphasized that enrollment of women should reflect the burden of HIV carried by women, with a few suggesting that clinical trials should occur in parts of the world where women face disproportionate burdens of HIV. One community member suggested exceeding local epidemiologic trends for the inclusion of women in HIV trials to redress the legacy of women's under-representation. Interviewees also highlighted how representation of women in HIV clinical research should be driven by scientific questions, and that enrollment figures could vary based on factors such as safety concerns, study phase, and number of women needed to conduct sex-based analyses.

Participants commented that researchers should set enrollment goals to answer scientific questions. This theme was most distinctly expressed by the biostatistician, who also explained the importance of taking target populations into account. A community member cautioned about the use of the word "target" in recruitment efforts, as this word may be stigmatizing and triggering, and offered "priority populations" as a more affirming, alternative term.

Community members discussed prioritizing enrollment of groups who would benefit the most from scientific advancements, such as people struggling with adherence to daily HIV treatment. One community member mentioned that having no or few women participating in research limits trust or confidence in research results.

Common Challenges to Inclusion of Women in HIV Cure Research—In response to the topic of common challenges to inclusion of women in HIV cure research, participants identified categories of challenges including protocol development, clinical aspects, type of intervention, psychosocial concerns, as well as engagement, logistical and institutional-level challenges. Some of these challenges were not specific to women with HIV or to HIV cure research.

Biomedical and community participants described protocol-level challenges, such as intensity of trials in terms of time commitments, invasiveness of procedures, stringent inclusion/exclusion criteria, contraceptive requirements for people of child-bearing potential, placebo-controlled designs, and inclusion of ATIs. One community member was worried about feeling abandoned by the research team after a clinical trial.

Biomedical researchers focused on clinical-level challenges, such as sample collection by leukaphereses being more difficult for people assigned female at birth due to having smaller veins. Both biomedical researchers and community members noted product safety profiles and limited prospects of direct clinical benefits from participation in most HIV cure trials as challenges to participation.

Community members commented on psychosocial challenges, such as the stigma associated with HIV, the difficulty of protecting one's privacy during a trial, and trauma associated with being a long-term HIV survivor. Intimate partner violence (IPV) was also perceived as an important barrier for many women. Two community members shared how hard they worked to sustain viral suppression, with both describing mental health challenges (e.g., anxiety, depression) being a part of the experience.

Biomedical researchers and community members noted challenges with engagement and outreach starting with outreach teams that do not include women. Participants also mentioned recruitment bias evident in studies implemented by men, manifested by a lack of outreach and education focused on recruiting women.

Most participants mentioned logistical challenges (see Logistical Barriers for Women). Community members also emphasized the difficulty of navigating complex institutions, environments not always feeling welcoming for women and general distrust in research. One biomedical researcher noted HIV cure studies are not being conducted where women are most affected by the epidemic (e.g., Africa).

Meaningful Participation of Women in HIV (Including Cure) Research

Successful and Less Successful Clinical Trial Examples—Participants identified a few studies that had successfully recruited women, highlighting the feasibility of attending to women's needs and circumstances. For example, they noted that the Gender, Race, and Clinical Experience (GRACE) experience stressed the importance of emphasizing retention strategies developed to ensure that women completed the study.

In the field of HIV cure research, the ACTG 5366 study enrolling 100% women received several mentions.

Community members recounted examples of less successful clinical research. These included studies that only enrolled men or that failed to provide results back to women. Participants also noted the oral pre-exposure prophylaxis (PrEP) trials that failed to enroll cisgender women.

Steps to Facilitate More Equitable Participation of Women—Protocol-level solutions offered centered around including women in the research planning stages, making

trial eligibility criteria more lenient (including contraceptive requirements such as double barrier contraception), having clear enrollment mandates to include women as well as allowance for enrollment freezes to give sites enough time to achieve this goal. Participants also highlighted the need for strong justifications if only enrolling men.

Community members focused on implementation solutions, emphasizing reducing the burden of trial participation (e.g., shorter time commitments, telemedicine visits), valuing women's unique lived experiences (including social, behavioral, and mental and sexual health), customizing research experiences, paying attention to women's needs outside of research and making women feel like they are part of something important.

Biomedical researchers and community members provided institution-level solutions, such as involving sites that have adequate infrastructure and underrepresented populations (including more sites in the Southern part of the U.S.), conducting recruitment where women receive HIV care, engaging primary care providers, ensuring representation at all levels, and maintaining trustworthiness of research teams.

Community members emphasized the critical importance of robust community engagement and outreach, recommending having attractive recruitment materials, engaging peer navigators, outreach workers and case managers, involving community members as trusted partners, using simple language, and not forgetting to share results back with the community.

Disaggregating Scientific Data by Sex and Gender—All participants agreed that scientific data should be disaggregated by sex and/or gender, when possible. Biomedical researchers expressed wanting to see data disaggregation by sex as early as possible in the research process. Biomedical researchers explained that data disaggregation was easier when more women were included in trials, and with later-phase studies. They also advocated for more standardization and diligence in reporting, as well as reporting mandates at conferences and in scientific publications.

Biomedical researchers provided reasons why data disaggregation by sex represented a best practice, as the breakdown can help highlight scientific gaps, recruitment disparities, and help answer scientific questions around potential differences in safety or efficacy.

Community members, in turn, appreciated having data displayed by sex and gender to understand how people's participation made a difference. They explained that seeing one's group represented helped them identify with the research and feel included. However, one biomedical researcher and two community members noted that data disaggregation by gender was much more challenging than by sex due to frequent mis-categorizations and misclassifications of participants by gender. A community member wanted to see more nuances in reporting because statistics oftentimes overlooks important nuances. She suggested going beyond sex and gender to also account for physiology.

Testing Interventions in Women—Biomedical researchers' narratives centered around the need to include women in trials, due to sex being an important host variable affecting efficacy of some HIV cure strategies. They emphasized that interventions that involve the

immune system, latency reversal or genetic manipulation should carefully consider the inclusion of women.

Two community members considered stem cell transplants as less relevant to them, because they did not have cancer. A biomedical researcher and two community members expressed concerns around cell and gene therapies, because of the potential risks of reproductive toxicity (relevant to both people assigned female and male at birth).

Several participants discussed the need to minimize the side effects of interventions. A biomedical researcher highlighted the importance of better understanding differences in risk tolerance by sex and gender. Two community members emphasized the need for close clinical monitoring during HIV cure research. Alongside monitoring, participants stressed the need to better explain HIV cure strategies to women with HIV, including potential risks. They wanted to see all HIV cure research options presented to women to allow them to make informed decisions about whether to participate. Community members also wanted more communications developed for and directed towards women as the primary audience.

Willingness to Undergo Invasive Procedures—Participants felt that women would be willing to undergo invasive study procedures, such as gut or lymph node biopsies. Two reasons given were altruism and women generally being more familiar with invasive medical procedures. One biomedical researcher and two community members countered this, saying that willingness to undergo biopsies would be specific to the individual rather than their sex or gender. Two biomedical researchers mentioned their experiences with women being willing to undergo biopsies for altruistic reasons.

Additional factors mentioned that might affect willingness to undergo biopsies, mostly from the perspectives of community members, included level of invasiveness, frequency of biopsies, level of embarrassment, pain and/or pain medications involved, sedation, recovery time, compensation, and level of responsibility taken by the investigator(s) for study-related injuries. A community member described how some invasive procedures may be triggering for women who have had past physical abuse.

People of Child-Bearing Potential—There was divergence on the requirement by cure trials that individuals who could bear children use double barrier contraception. One biomedical researcher favored double barrier, while a community member opposed the requirement. A community member underscored that people’s situations or fertility desire may change during a clinical trial. Two biomedical researchers and a community member mentioned that reproductive issues are not unique to women and apply to men as well, since men also contribute genetic material to the pregnancy. A biomedical researcher emphasized the need for reliable methods of contraception and clear communication with participants around safety issues.

Participants described how contraceptive requirements should depend on the intervention being tested and that communicating potential reproductive risks should be backed up by robust pre-clinical data, particularly since pharmaceutical companies tend to be risk averse. Participants considered variability by age, with one community member noting that younger

people may be more concerned with infertility risks. In addition, participants felt it was important to include both pre- and post-menopausal women in HIV cure trials, mentioning that hormones may impact the HIV reservoir and ART-free durable control.

Two biomedical researchers explained why pregnant and breastfeeding/chest-feeding people should be excluded from HIV cure trials involving ATIs, given risks of HIV transmission to the fetus or infant. A biomedical researcher suggested that the new World Health Organization (WHO) guidance on the inclusion of pregnant and lactating persons in clinical trials be adapted to HIV cure research. Some participants mentioned that considerations for people of child-bearing potential could be particularly relevant for trials conducted in sub-Saharan Africa, because of societal pressures for women to have children and/or to breastfeed.

Women and HIV Treatment Interruptions

Women's Willingness to Interrupt HIV Treatment—Most participants indicated women would be willing to undergo an ATI, but that this should be accompanied with adequate informed consent and education on how ATI risks would be mitigated. Although participants indicated women would be willing to interrupt HIV treatment, considerations were not specific to women with HIV.

Community members stated that women would be willing to undergo an ATI to help ensure representation of women in trials and to alleviate the long-term side effects of HIV medications. Their concerns centered around possible health regression associated with viral rebound, as well as the impact of contradicting ART adherence messages, need to relearn adherence after an ATI, risk of development of ART resistance requiring changing an effective regimen, and concern over exclusion of women trying to conceive due to risk of HIV transmission. A community member explained that she was occasionally not taking her ART pills, and she would want to know that she is doing it safely while being monitored and benefitting HIV cure science. Another community member described her ritualistic relationships with her pills and why she would not be willing to interrupt ART.

In turn, biomedical researchers raised concerns about ATI risk, such as inflammation, and immune activation and possible decrease in CD4 T-cell count associated with viral rebound.

Enrollment of Women in ATI-Inclusive Trials—Participants provided considerations ranging from the need for robust informed consent, establishing relationships of trust with investigators and opportunities for open communication during trial implementation. The potential for pregnancy and breast/chest feeding during an ATI was highlighted, together with resuming ART if a person becomes pregnant during the trial.

Three community members recommended engaging HIV care providers, peer navigators and community health workers to ensure they understand ATIs and can provide women with a strong support system. Others recommended adopting a holistic approach to ATIs including performing mental health checks and ensuring food security.

Several participants expressed views about partner protections during ATI, including understanding partnership status, communicating HIV transmission risk during viral rebound, and providing adequate counseling and disclosure support. Some emphasized that requiring HIV and/or ATI disclosure could lead to additional stigma for women. A community member was adamant about the need to make women aware of local HIV criminalization laws and legal risks prior to an ATI. Another issue that arose was IPV and its prevalence among women with HIV. A community member wanted to see trauma-informed research included in ATI studies.

Additional Considerations

Logistical Barriers for Women—Logistical considerations centered around transportation and childcare with recommendations to make transportation easier for women by coordinating ride shares and offering free parking. Two community members expressed a desire for assistance with childcare, while researchers described on-site childcare as complicated.

Another issue raised to support enrollment of women was flexibility with study visits scheduling, including offering visits during non-traditional hours and home visits. One community member expressed her excitement about the idea of home-based viral load testing which she said would be a game changer for her.

Providing adequate compensation to support women's participation emerged as a salient theme given the prevalence of financial dependency among women. Community members noted that engaging in research should not come at a cost to study participants, and that appropriate compensation and acknowledgement should be a given to them. A biomedical researcher suggested incentivizing sites to enroll more women, though that person was unsure whether IRBs would allow it. Another biomedical researcher remarked that compensation that exceeds $US 600 per year is taxed, and that this represents a disincentive to participate.

Additional logistical considerations mentioned included the amount of paperwork required of trial participants, potential for access to free birth control, mental health support at the trial site, and partnering with CBOs who can offer wrap-around and other needed support services that cannot be provided at the site. A biomedical researcher commented that clinical research sites are allocated a limited budget restricted to protocol implementation, such that additional costs involved in reducing logistical barriers for women will require a fundamental change from policy makers, investigators and sponsors.

Transgender and Gender-Diverse Individuals—Participants noted that it is a priority to include transgender people in HIV cure studies for scientific, sociological, and ethical reasons, including the need to pay attention to the impact of sex hormones and gender-affirming care.

Several participants mentioned intersecting social factors, such as discrimination, stigma, stress, violence, and economic vulnerabilities that are unique to TGD individuals. They suggested building research teams that are gender responsive and representative of the

transgender population (e.g., peer navigation from the transgender community). They wanted to see transgender people involved as true partners in research and providing input into the research process; and they felt that trauma-informed research is even more critical in this population.

Additional Suggestions—Additional suggestions included building cohorts of women ready to participate in HIV cure trials and appreciating the importance of precision medicine for future HIV cure research. Participants stressed not only presenting trial opportunities to women, but also explaining the scientific gaps. Two biomedical researchers and a community member mentioned the importance of investigator-participant relationships and healing-centered protocol designs. Community members concurred on wanting HIV cure research to be a humanizing endeavor.

Additional select quotes can be found in Table 3. Supplementary Table 1 contains additional quotes.

Discussion

Our qualitative interview study examined ways to achieve meaningful involvement of women in HIV cure research. Overall, there was convergence on the need to design clinical trials that place women – instead of product development – at the center (39). Our findings extend the literature by contributing empirical findings and concrete recommendations from the perspectives of key stakeholders and augment recent calls to actions to increase the meaningful involvement of women in HIV research and clinical trials more broadly (8,9,40-42). Findings corroborate the views that purposeful and deliberate change is urgently needed (30). Importantly, ensuring representation of women in HIV cure research requires sustained commitments and investments of time, money, and effort from funders and the clinical research establishment (30). HIV cure trials will also need to be designed and implemented through the lenses of intersectionality (e.g., gender, race, ability, and other factors that may affect participation) (43).

A key consideration that emerged from this study is the need to ensure that HIV cure studies reflect HIV epidemiologic trends, particularly given the evidence that HIV cure trial participants do not reflect the global epidemic (10,11). This disconnect has profound and long-lasting downstream implications for the development and applicability of safe and effective HIV cure interventions for all PWH worldwide (25,26).

Participants noted several challenges to women's enrollment, possible strategies to overcome these challenges and examples of studies that have embraced inclusion of women. GRACE was highlighted as a landmark HIV treatment trial that showed the possibility of recruiting underrepresented women and racialized people into HIV clinical research (44-46). The GRACE study was also singled out for its intentional design and prioritization of women's needs and priorities. In addition to recruitment strategies, GRACE highlighted the importance of retention strategies to ensure women were able to complete the study. GRACE continues to serve as an example for best practices in women-centered clinical trials. Importantly, women with HIV need equity not only in terms of numbers, but also in

the most fundamental way of being involved upstream in planning clinical trials – including the scientific questions to be addressed and basic aspects of research implementation.

Closer to the HIV cure research field, the ACTG 5366 study (*Selective Estrogen Receptor Modulators to Enhance the Efficacy of Viral Reactivation with Histone Deacetylase Inhibitors*) was highlighted for being the first trial conducted exclusively in women, and the finding that women enrolled in ACTG 5366 had an overall positive experience and would be willing to participate again (28). While participants in our study cited stigma as a potential barrier to participation, ACTG 5366 participants noted that it served as a motivator to engaging in the trial (28), underscoring the need for more research on how stigma affects women's desire to participate in HIV cure trials. The ACTG 5366 study further showed the value of integrating participant-centered assessments and acknowledging the psychosocial and affective aspects associated with HIV cure research participation for women (28). It is possible that the inclusion of the social sciences study in A5366 may have positively affected participants' experiences in the trial by acknowledging their lived experiences. To get a holistic view of how research participation fits into the context of women's lives, researchers will need to include measures beyond biological outcomes (41,47,48). Socio-behavioral studies, including those using qualitative approaches, assessing mental health outcomes, and including psychometric measures, will be necessary to get a full picture of women's health and quality of life in the context of HIV cure trials (39).

Key recommendations to increase the meaningful involvement of women in HIV cure research included the need for intentional enrollment goals, frequent and mandatory reporting on enrollment, and incentives for sites to enroll women, which align with prior recommendations (6). Additional themes included the need for agency and self-determination, attention to lived experiences, trauma and healing, and adequate support (e.g., logistical, psychosocial, mental, emotional, and physical). Few HIV trials have documented best practices for the enrollment of women in HIV trials. The ACTG Women's Health Collaborative Science Group (WHCSG) has prepared best practices for the recruitment and retention of women in HIV trials. The ACTG Women's Outreach Workers (WOWs) is an example of proactive outreach program to enhance recruitment of women at two clinical research sites (13). Key lessons learned from this initiative are that women's enrollment is proportional to funding levels and institutional support, and women are more likely to participate in studies that address scientific questions that are directly relevant to them (13). The WOW program further exemplified the need to leverage opportunities for expanded community engagement by reaching out to local CBOs (13). The success seen with the WOW program – in terms of enrollment numbers for trials opened at the time of implementation, and in having women join recruitment registries – revealed the need for greater investments in community engagement efforts to reach women with HIV where they are. Another recent innovation to enhance the representation of diverse groups in HIV clinical research has been the Representative Studies Rubric (RSR) (49), designed by the Office of HIV/AIDS Network Coordination (HANC). HIV cure research teams can apply the rubric to clinical trials to assess the representativeness of study populations in terms of sex assigned at birth, gender, race, ethnicity, age, and other factors. The RSR effort has also called for the urgent collection of transgender-inclusive data from HIV study participants to

prevent the erasure of transgender (and gender-diverse) and non-binary people from clinical research (49).

Our study showed convergence on the need to disaggregate data by sex and gender whenever possible, and as early as possible in the research process. This finding aligns with the 2016 NIH policy on sex as a biological variable (NOT-OD-15-102) and published guidelines on sex and gender reporting (16,50). However, these policies are not always enforced in scientific meetings or publications, evidenced by a review of 55 publications on HIV cure research that showed only 51% of studies conducted in 2019 included demographic information (51). Johnston and colleagues (17) provided six recommendations to elevate sex as a biological variable, including: 1) reporting demographic data (e.g., sex, age and race) of people included in studies and data analyzed, 2) analyzing safety and efficacy outcomes by demographic variables, 3) powering studies to allow for sex-based analyses, 4) conducting meta-analyses among similar data and interventions to strengthen evidence, 5) implementing standardized endpoints in trials to facilitate pooling of data, and 6) ensuring animal studies also include sex as a demographic variable. Scully argued that sex-stratified analyses not only benefit women in the long-run but can also help uncover promising research pathways relevant to both women and men (25,26). A 2022 NASEM report recommended that studies should collect data on gender and report these by default (52). Collection of data on sex as a biological variable should be limited to circumstances where information about sex is relevant (e.g., genetic, anatomical, or physiological processes and their connections to patterns of health and disease). For human participants, data collection on sex should accompany data collection on gender (52).

Overall, participants agreed that women would be willing to participate in HIV cure trials, related procedures (e.g., biopsies), and ATIs. Our study further underscored the need to support women's agency to decide whether to participate in HIV cure research, acknowledging there might be heterogeneity in thinking about HIV cure research. A survey of PWH conducted in the United States found sex and gender differences in perceptions of risks and preferences for HIV control strategies (53). For example, in that survey, cisgender and transgender women were found to be less willing to switch to new HIV remission strategies that would be accompanied with worse side effects (OR = 0.44 [compared to cisgender men]), if there were increases to their risk of developing health issues later in life (OR = 0.53), and if the study required an ATI with an uncertain outcome (OR = 0.59) (53). In all clinical studies, participants ascribe value judgements to possible risks and benefits, and potential trade-offs compared with other therapeutic options (54). Finding the attributes of HIV cure that would be most meaningful to women should be considered as part of a gender-responsive and gender-affirming drug development process. A question that remains unresolved in our study is whether the likelihood of equitable involvement or inclusion of women in HIV cure research would depend on the type of strategy or 'cure' being tested, and this should be considered as a scientific question moving forward.

We found divergence around the enforcement of double barriers of contraception as part of HIV cure trials. Community members were less in favor of the double barrier eligibility requirement compared to biomedical researchers, and wanted each participant evaluated individually, following the principle of autonomy. For safety reasons, current ATI protocols

exclude pregnant and breastfeeding people from HIV cure trials due to concern over transmitting HIV to the infant (19). However, not all HIV cure trials require ATIs, and there may be ways to meaningfully engage pregnant and breastfeeding/chest-feeding people with HIV in non-ATI studies, such as reservoir assessments, or pediatric HIV cure trials. The issue of excluding people who desire to become pregnant will become a critical topic as trials with ATIs are scaled-up in sub-Saharan Africa, where it is common for women to avoid contraception and breastfeed. Namiba and colleagues provided recommendations for making contraceptive eligibility requirements more person-centered and women-friendly, by thinking carefully about these requirements and ensuring they are respectful of women, men, gender-non-conforming and people from the lesbian, gay, bisexual, transgender, and queer (questioning), intersex, asexual (and agender) (LGBTQIA+) community (55), providing a full list of contraceptive options, avoiding categorizing them as “reliable” and “unreliable”, and recognizing that fertility desires can be fluid (55). Further, protocol language should clearly indicate categories of people for whom contraceptive requirements may not be applicable (e.g., lesbian women who do not engage in intercourse with male partners).

Moreover, participants in our study provided considerations for women undergoing ATIs, such as appreciating the lived experiences and psychosocial trajectories of women interrupting treatment and adopting a holistic approach to ATI trial design that includes mental health checks. Considerations around partner protections align with recent empirical work recommending close attention to gender and power dynamics in ATI trial designs, and implementing these through the lenses of intersectionality, particularly for women who may be experiencing IPV (7). Logistical aspects, such as transportation, childcare, and flexibility with scheduling visits, emerged prominently in our study, consistent with recent empirical studies focused on assessing women’s participation in trials (28).

Our study participants highlighted that there is a critical gap in engaging transgender women, transfeminine, and non-binary people in HIV cure research, including the impact of sex hormones and gender-affirming care. Given the higher burden of HIV in transgender individuals (56), it is an urgent imperative to engage this population in HIV cure research. Designing trials that are trauma-informed, and that attempt to increase the benefit of participation (57), is a priority. A recent socio-behavioral study conducted among Black transgender women with HIV in the United States showed that this group may be apprehensive around interrupting treatment (58). Other concerns should be addressed as well, such as the risk of transphobic violence when traveling to study visits, and the need to build a community of transgender women interested in HIV cure research (58). Poteat and colleagues issued five recommendations to effectively engage Black transgender women in HIV cure research, such as 1) training researchers in transgender health 2) designing protocols with gender-affirming frameworks, 3) mentoring transgender researchers, 4) making transgender participants feel welcome, and 5) increasing community engagement efforts (58). It will be important for institutions implementing HIV cure trials to increase the trustworthiness of research (59). Of note, some participants in our study spoke of the pervasive mis-categorizations and misclassifications of people of diverse gender in research, particularly transgender and non-binary individuals. For example, transgender women are oftentimes mis-categorized as men who have sex with men (MSM) (5), and as noted by participants in our study, transgender men remain invisible in HIV research. Moreover,

most studies fail to include scientific questions specific to transgender or non-binary people, exacerbating disparities, marginalization and even erasure from HIV research (5).

Resounding themes from our study were to make HIV cure research a humanizing enterprise for women and to engage communities at every stage of the process (60). The concept of healing-centered design would represent a welcome innovation in the field of HIV cure research with women, recognizing the importance of both physical and mental health (61).

Considerations for the meaningful involvement of women in HIV cure research are summarized in Table 4.

Limitations

We acknowledge limitations to our study. Our sample was predominantly composed of women. Individuals interviewed may not be representatives of all voices who could speak about the meaningful involvement of women in HIV cure research, or of those facing participation barriers. Some groups of women may be under-represented in our study, such as transgender women and transgender men, women who are struggling with HIV treatment adherence, women who use drugs and alcohol, women who sell sex, women who are homeless or unstably housed, women who acquired HIV perinatally (and who may share experiences and concerns like long-term survivors), and women with HIV at the end-of-life. In addition, there were uneven number of participants in the different groups interviewed (e.g., biomedical researchers and community members), and perspectives of HIV care providers are missing. We used an inductive method to analyze and report the data, and we recognize that several of the considerations provided were not specific to women with HIV or to HIV cure research, but remained relevant to increasing the meaningful involvement of women. The topic of meaningful engagement of women in HIV cure research will require broad and sustained stakeholder input and robust community engagement in diverse settings and contexts.

Conclusions

Our empirical inquiry extends recent calls to action to increase diversity of people involved in HIV cure research, as well as reporting on this diversity and intentionally removing barriers to participation. Redressing the under-inclusion of women in HIV cure research is an urgent imperative. The entire field must mobilize and reform to achieve this goal. Given upcoming HIV cure trials being scaled up in Sub-Saharan Africa, equitable enrollment in trials that include ATIs must consider and center women in design and implementation. Meaningfully involving women across the gender spectrum in HIV cure research is needed to ensure that interventions are safe, effective, scalable, and acceptable for all PWH.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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List of Abbreviations

ACTG	AIDS Clinical Trials Group
AML	Acute Myeloid Leukemia
ART	Antiretroviral Treatment
ATI	Analytical Treatment Interruption
CAB	Community Advisory Board
CBO	Community-Based Organization
CBPR	Community-Based Participatory Research
DARE	Delaney AIDS Research Enterprise
FDA	Food and Drug Administration
GRACE	Gender, Race and Clinical Experience
HANC	Office of HIV/AIDS Network Coordination
HIPAA	Health Insurance Portability and Accountability Act
HIV	Human Immunodeficiency Virus
ICW	International Community of Women Living with HIV
IDGPH	Institute of Infectious Diseases and Global Public Health
IPV	Intimate Partner Violence
IRB	Institutional Review Board
LQBTQIA+	Lesbian, Gay, Bisexual, Transgender, and Queer (Questioning), Intersex, Asexual (and Agender)
MGH	Massachusetts General Hospital
MSM	Men Who Have Sex with Men
NASEM	National Academies of Sciences, Engineering, and Medicine
NIH	National Institutes of Health

ORWH	Office of Research on Women's Health
PrEP	Pre-Exposure Prophylaxis
PWH	People with HIV
RSR	Representatives Studies Rubric
SFAF	San Francisco AIDS Foundation
TGD	Transgender and gender diverse
UCSD	University of California San Diego
UCSF	University of California San Francisco
UNC-CH	University of North Carolina at Chapel Hill
U = U	Undetectable = Untransmittable
U.S.	United States
WGCSG	Women's Health Collaborative Science Group
WHO	World Health Organization
WOW	Women's Outreach Workers
WRI	Women's Research Initiative on HIV/AIDS

References

1. UNAIDS. UNAIDS Global AIDS Update [Internet]. Geneva; 2022. Available from: https://www.unaids.org/sites/default/files/media_asset/2022-global-aids-update_en.pdf
2. UNAIDS. Dangerous Inequalities: World AIDS Day Report 2022 [Internet]. 2022 [cited 2023 Jan 8]. Available from: https://www.unaids.org/sites/default/files/media_asset/dangerous-inequalities_en.pdf
3. UNAIDS. HIV and Transgender and Other Gender-Diverse People - Human Rights Fact Sheet Series [Internet]. 2021 [cited 2023 Feb 6]. Available from: https://www.unaids.org/sites/default/files/media_asset/04-hiv-human-rights-factsheet-transgender-gender-diverse_en.pdf
4. Curno MJ, Rossi S, Hodges-Mameletzis I, Johnston R, Price MA, Heidari S. A Systematic Review of the Inclusion (or Exclusion) of Women in HIV Research: From Clinical Studies of Antiretrovirals and Vaccines to Cure Strategies. JAIDS. 2016;71(2):181–8. [PubMed: 26361171]
5. Tordoff D, Minalga B, Beck Gross B, Martin A, Caracciolo B, Barbee L, et al. Erasure and Health Equity Implications of Using Binary Male/Female Categories in Sexual Health Research and Human Immunodeficiency Virus/Sexually Transmitted Infectious Surveillance: Recommendations for Transgender-Inclusive Data Collection and Reporting. Sex Transm Dis. 2022;49(2):e45–9. [PubMed: 34407018]
6. Gianella S, Tsibris A, Barr L, Godfrey C. Barriers to a Cure for HIV in Women. J Int AIDS Soc. 2016;19(1):1–10.
7. Dubé K, Kanazawa JT, Campbell C, Boone CA, Maragh-Bass A, Campbell DM, et al. Considerations for Increasing Racial, Ethnic, Gender and Sexual Diversity in HIV Cure-Related Research with Analytical Treatment Interruptions: A Qualitative Inquiry. AIDS Res Hum Retroviruses. 2021;38(1):50–63. [PubMed: 33947268]

8. Campbell D, Cowlings P, Tholanah M, Robinson M, Graham G, Aseru S, et al. “In diversity there is beauty and there is strength.” - Dr. Maya Angelou - A Community Call to Action to Prioritize Inclusion and Enrollment of Women in HIV Cure-Related Research. Journal of Acquired Immune Deficiency Syndrome. 2022;
9. APHA. Support for Women’s Inclusion in HIV-Related Clinical Research [Internet]. 2022 [cited 2023 Jan 25]. p. 1–13. Available from: https://apha.org/Policies-and-Advocacy/Public-Health-Policy-Statements/Policy-Database/2023/01/18/Womens-Inclusion-in-HIV-Research
10. Barr L, Jefferys R. A Landscape Analysis of HIV Cure-Related Clinical Research in 2019. J Virus Erad [Internet]. 2020;6(4):100010. Available from: 10.1016/j.jve.2020.100010 [PubMed: 33294212]
11. Barr L, Jefferys R. A Landscape Analysis of HIV Cure-Related Clinical Trials and Observational Studies in 2018. J Virus Erad. 2019;5(4):212–9. [PubMed: 31754444]
12. Smeaton LM, Kacanek D, Mykhalchenko K, Coughlin K, Klingman KL, Koletar SL, et al. Screening and Enrollment by Sex in HIV Clinical Trials in the United States. Clin Infect Dis. 2019;Sept. 29.
13. Barr E, Dubé K, Swaminathan S, del Rio C, Campbell DM, Paez-Quinde M, et al. Impact of Dedicated Women’s Outreach Workers (WOWs) on Recruitment of Women in ACTG Clinical Studies. HIV Res Clin Pract. 2021;22(2):37–45. [PubMed: 34143949]
14. Grewe ME, Ma Y, Gilbertson A, Rennie S, Tucker JD. Women in HIV Cure Research: Multilevel Interventions to Improve Sex Equity in Recruitment. J Virus Erad. 2016;2:e15–7.
15. NIH. National Institutes of Health Revitalization Act of 1993 [Internet]. 1993 [cited 2023 Jan 9]. Available from: https://orwh.od.nih.gov/sites/orwh/files/docs/NIH-Revitalization-Act-1993.pdf
16. ORWH [Internet]. 2016 [cited 2023 Jan 9]. NIH Policy on Sex as a Biological Variable. Available from: https://orwh.od.nih.gov/sex-gender/nih-policy-sex-biological-variable#:~:text=NIH%20expects%20that%20sex%20as,to%20study%20only%20one%20sex
17. Johnston R, Heitzeg M. Sex, Age, Race and Intervention Type in Clinical Studies of HIV Cure: A Systematic Review. AIDS Res Hum Retroviruses. 2015;31(1):85–97. [PubMed: 25313793]
18. Deeks SG, Archin N, Cannon P, Collins S, Jones RB, De Jong MAWP, et al. Research Priorities for an HIV Cure: International AIDS Society Global Scientific Strategy 2021. Nat Med [Internet]. 2021; Available from: https://www.nature.com/articles/s41591-021-01590-5
19. Julg B, Dee L, Ananworanich J, Barouch D, Bar K, Caskey M, et al. Recommendations for Analytical Treatment Interruptions in HIV Research Trials. Report of a Consensus Meeting. Lancet HIV. 2019;6(4):e259–68. [PubMed: 30885693]
20. Bryson Y HIV-1 Remission with CCR5 Delta32 Haplo-Cord Transplant in a U.S. Woman: Impact P1107. In: Conference on Retroviruses and Opportunistic Infections (CROI) [Internet]. 2022 [cited 2023 Jan 9]. Available from: https://www.impaactnetwork.org/sites/default/files/inline-files/Final%20IMPAACTP1107_FINAL%20CROI%20%20revised%2012Feb2022%20BRYSON%203.pdf
21. Turk G, Seiger K, Lian X, Sun W, Parsons E, Gao C, et al. A Possible Sterilizing Cure of HIV-1 Infection without Stem Cell Transplantation. Annals of Internal Medicine [Internet]. 2022 [cited 2023 Jan 9];175(1):95–100. Available from: https://www.acpjournals.org/doi/epdf/10.7326/L21-0297 [PubMed: 34781719]
22. Grabar S, Selinger-Leneman H, Abgrall S, Pialoux G, Weiss L, Costagliola D. Prevalence and Comparative Characteristics of Long-Term Nonprogressors and HIV Controller Patients in the French Hospital Database on HIV. AIDS. 2009;23(9):1163–9. [PubMed: 19444075]
23. Saez-Cirion A, Hamimi C, Bergamaschi A, David A, Versmisse P, Melard A, et al. Restriction of HIV-1 Replication in Macrophages and CD4+ T Cells from HIV Controllers. Blood. 2011;118(4):955–64. [PubMed: 21642597]
24. Goujard C, Girault I, Rouzioux C, Lecuroux C, Deveau C, Chaix M, et al. HIV-1 Control after Transient Antiretroviral Treatment Initiated in Primary Infection: Role of Patient Characteristics and Effect of Therapy. Antivir Ther. 2012;17(6):1001–9. [PubMed: 22865544]
25. Scully EP. Sex Differences in HIV Infection. Curr HIV/AIDS Rep. 2018;15(2):136–46. [PubMed: 29504062]

26. Scully EP, Street NW. Sex Differences in HIV Infection: Mystique Versus Machismo. Pathog Immun. 2018;3(1):82–113. [PubMed: 30140783]
27. Gianella S, Rawlings S, Dobrowolski C, Nakazawa M, Chaillon A, Strain M, et al. Sex Differences in Human Immunodeficiency Virus Persistence and Reservoir Size During Aging. Clin Infect Dis. 2022;75(1):73–80. [PubMed: 34612493]
28. Dubé K, Hosey L, Starr K, Evans D, Hoffman E, Campbell D, et al. Participant Perspectives in an HIV Cure-Related Trial Conducted Exclusively in Women in the United States: Results from AIDS Clinical Trials Group (ACTG) 5366. AIDS Res Hum Retroviruses. 2020;36(4):268–82. [PubMed: 32160755]
29. Rossouw T, Tucker JD, van Zyl GU, Sikwesi K, Godfrey C. Barriers to HIV Remission Research in Low- and Middle-Income Countries. J Int AIDS Soc [Internet]. 2017;20(1):1–9. Available from: http://www.jiasociety.org/index.php/jias/article/view/21521
30. NASEM. Improving the Representation of Women and Underrepresented Minorities in Clinical Trials and Research [Internet]. 2022. Available from: https://www.nationalacademies.org/our-work/improving-the-representation-of-women-and-underrepresented-minorities-in-clinical-trials-and-research
31. Griesbeck M, Scully E, Altfeld M. Sex and Gender Differences in HIV-1 Infection. Clin Sci. 2016;130:1435–51.
32. Walker RL, MacKay D, Waltz M, Lyerly AD, Fisher JA. Ethical Criteria for Improved Human Subject Protections in Phase I Healthy Volunteer Trials. Ethics Hum Res. 2022 Sep 1;44(5):2–21.
33. Boeije H. A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews. Qual Quant. 2002;36:391–409.
34. Cresswell J. Research Design. Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed. Sage Publications; 2013.
35. Cresswell J. Turning the Story. In: Qualitative Inquiry and Research Design. 1998. p. 219–29.
36. Wallterstein N, Duran B, Oetzel J, Minkler M. Community-Based Participatory Research for Health: Advancing Social and Health Equity. Jossey-Bas. San Francisco, CA; 2017.
37. Hsieh HF, Shannon SE. Three Approaches to Qualitative Content Analysis. Qual Health Res. 2005;
38. Guest G. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. Field methods [Internet]. 2006 Feb 1 [cited 2016 Oct 4];18(1):59–82. Available from: http://fmx.sagepub.com/cgi/doi/10.1177/1525822X05279903
39. Dubé K, Barr L, Palm D, Brown B, Taylor J. Putting Participants at the Centre of HIV Cure Research. Lancet HIV. 2019;3018(19):18–9.
40. BEAT-HIV. BEAT-HIV Position Paper. Joining Forces to Advance HIV Cure Research [Internet]. Philadelphia; 2020 [cited 2023 Jan 2]. Available from: https://beat-hiv.org/ati-position-paper/
41. WRI. Advancing Meaningful Inclusion of All Women in HIV Research and Clinical Trials [Internet]. 2022 [cited 2023 Jan 4]. Available from: https://www.thewellproject.org/hiv-information/wri-2022-advancing-meaningful-inclusion-all-women-hiv-research-and-clinical-trials#:~:text=The%20Women's%20Research%20Initiative%20on,May%2012%2D15%2C%202022.
42. Kozlov M. FDA to Require Diversity Plan for Clinical Trials. Nature. 2023;(Online Ahead of Print).
43. Bowleg L. Evolving Intersectionality Withing Public Health: From Analysis to Action. Am J Public Health. 2021;111(1):88–90. [PubMed: 33326269]
44. Falcon R, Averitt Bridge D, Currier J, Squires K, Hagins D, Schaible D, et al. Recruitment and Retention of Diverse Populations in Antiretroviral Clinical Trials: Practical Applications from the Gender, Race And Clinical Experience Study. J Womens Health. 2011;20(7):1043–50.
45. Currier JS, Martorell C, Osiyemi O, Yin MT, Ryan R, de La Rosa G, et al. Effects of Darunavir/Ritonavir-Based Therapy on Metabolic and Anthropometric Parameters in Women and Men over 48 Weeks. AIDS Patient Care STDS. 2011 Jun 1;25(6):333–40. [PubMed: 21612545]
46. Squires K, Feinberg J, Bridge DA, Currier J, Ryan R, Seyedkazemi S, et al. Insights on GRACE (Gender, Race, and Clinical Experience) from the Patient's Perspective: GRACE Participant Survey. AIDS Patient Care STDS. 2013 Jun 1;27(6):352–62. [PubMed: 23701200]

47. Dubé K, Auerbach JD, Stirratt MJ, Gaist P. Applying the Behavioural and Social Sciences Research (BSSR) Functional Framework to HIV Cure Research. J Int AIDS Soc. 2019;22:e25404. [PubMed: 31665568]
48. Grossman CI, Ross AL, Auerbach JD, Ananworanich J, Dubé K, Tucker JD, et al. Towards Multidisciplinary HIV-Cure Research: Integrating Social Science with Biomedical Research. Trends Microbiol [Internet]. 2016 Jan [cited 2017 Jan 8];24(1):5–11. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4698010&tool=pmcentrez&rendertype=abstract [PubMed: 26642901]
49. HANC. The Representative Studies Rubric: A Tool to Enhance the Representativeness of Study Populations in Clinical Research [Internet]. 2022 [cited 2023 Jan 5]. p. 1–6. Available from: https://www.hanc.info/content/dam/hanc/resources/RSR-HANC-Website.pdf
50. Heidari S, Babor T, DeCastro P, Tort S, Curno M. Sex and Gender Equity in Research Rationale for the SAGER Guidelines and Recommended Use. Res Integr Peer Rev. 2016;1(1):2. [PubMed: 29451543]
51. Roberts C, Creamer E, Bonne C, Young A, Magnus M. Short Communication: Population Representative in HIV Cure Research: A Review of Diversity within HIV Cure Studies based in the United States. AIDS Res Hum Retroviruses. 2022;38(8):631–44. [PubMed: 35018803]
52. NASEM. Measuring Sex, Gender Identity, and Sexual Orientation [Internet]. 2022 [cited 2023 Jan 25]. Available from: https://nap.nationalacademies.org/catalog/26424/measuring-sex-gender-identity-and-sexual-orientation
53. Dubé K, Eskaf S, Evans D, Sauceda J, Saberi P, Brown B, et al. The Dose Response: Perceptions of People Living with HIV in the United States on Alternatives to Oral Daily Antiretroviral Therapy. AIDS Res Hum Retroviruses. 2019;Dec 4([Epub ahead of print]).
54. FDA. The Voice of the Patient [Internet]. 2014. Available from: http://www.fda.gov/downloads/ForIndustry/UserFees/PrescriptionDrugUserFee/UCM389379.pdf
55. Namiba A, Kwardem L, Dhairyawan R, Hale F, McGregor Read J, Anderson J, et al. From Presumptive Exclusion Towards Fair Inclusion: Perspectives on the Involvement of Women Living with HIV in Clinical Trials, Including Stakeholders' Views. Vol. 9, Therapeutic Advances in Infectious Disease. SAGE Publications Ltd; 2022. p. 1–17.
56. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide Burden of HIV in Transgender Women: A Systematic Review and Meta-Analysis. Lancet Infect Dis [Internet]. 2013;13(3):214–22. Available from: 10.1016/S1473-3099(12)70315-8 [PubMed: 23260128]
57. Minalga B, Chung C, Davids J, Martin A, Perry NL, Shook A. Research on Transgender People Must Benefit Transgender People. Lancet [Internet]. 2022 [cited 2023 Jan 2];399(10325):628. Available from: doi: 10.1016/S0140-6736(21)02806-3.
58. Poteat T, Aqil A, Corbett D, Evans D, Dubé K. "I would really want to know that they had my back": Transgender Women's Perceptions of HIV Cure-Related Research in the United States. PLoS One. 2020;15(12):e0244490. [PubMed: 33382760]
59. Wilkins C. Effective Engagement Requires Trust and Being Trustworthy. Med Care. 2018;56(10 Suppl 1):S6–8. [PubMed: 30015725]
60. Karris MY, Dubé K, Moore AA. What Lessons It Might Teach Us? Community Engagement in HIV Research. Curr Opin HIV AIDS 2019;Dec 30.
61. Hatcher A, Woollett N, Pallitto C, Garcia-Moreno C. A Conceptual Framework and Intervention Approach for Addressing Intimate Partner Violence in Pregnancy. In: Withers M, Erausquin JT, editors. Global Perspectives on Women's Reproductive and Sexual Health Across the Lifecourse. New York: Springer Books; 2017. p. 233–53.

Table 1:

IRB-Approved Interview Guide – Women's Involvement in HIV Cure-Related Research (United States, 2022)

Introduction

- First, thank you so much for your time.
- What is your current position and involvement in HIV-related research? What about research focused on women?
- Can you please describe your involvement, if any, in HIV (including cure)-related research?

Inclusion of Women in HIV (Including Cure) Clinical Research

- We'd love to hear your thoughts on how we should decide who is included in a HIV-related clinical trials. What are the primary requirements? How should we decide how many women versus men should be included?
- Can you please describe the common challenges to including women in HIV-related cure research?

Meaningful Participation of Women in HIV (Including Cure) Research

- Can you think of clinical trial examples in HIV research that were fairly equitable by sex and gender?
- What needs to be done to facilitate more equitable inclusion of women in trials?
- Do you think scientific data should be disaggregated by sex and gender? Why/why not?
- We'd love to hear your thoughts on women's willingness to test risky interventions? What might be some of the considerations?
- Do you think women would be willing to undergo invasive study procedures?
- What considerations should be taken about including people of child-bearing age?

Women and HIV Treatment Interruptions

- Can you please share your thoughts on whether women would be willing to interrupt HIV treatment to help advance HIV cure research?
- What might be the primary considerations for women undergoing HIV treatment interruptions? What safeguards should be in place for women undergoing HIV treatment interruptions?

Additional Considerations

- What responsibility should clinical research sites have in terms of providing additional assistance to women participating in clinical trials?
- Can you please share your thoughts on what additional factors should be considered during HIV cure-related trials involving women?
- What considerations should be taken with transgender and gender-diverse individuals in HIV cure-related research?

Wrap Up and Closing

- Is there anything that you would like to add or things we should know that we haven't yet discussed?
- Is there anyone else you can think of who we should try and speak with about this topic?

Thank you for taking the time to answer these questions. Your participation greatly contributes to our understanding of how we can best engage women in HIV related clinical research. Please feel free to contact us at any time if you have any questions about this interview or the research project.

Table 2:

Self-Identified Demographic Characteristics of Key Participant Interview Participants (United States, 2022)

Participant ID Number	Sex Assigned at Birth	Gender	Race	Ethnicity	Participant Type
01	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
02	F	W	Black/African American	Non-Latinx	Community Member
03	F	W	White/Caucasian	Non-Latinx	Community Member
04	F	W	White/Caucasian	Latina	Community Member
05	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
06	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
07	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
08	F	W	Black/African American	Non-Latinx	Community Member
09	F	W	White/Caucasian	Non-Latinx	Community Member
10	F	W	White/Caucasian	Non-Latinx	Community Member
11	F	W	Black/African American	Non-Latinx	Community Member
12	M	F	Asian	Non-Latinx	Community Member
13	F	W	White/Caucasian	Non-Latinx	Community Member
14	F	W	African	Non-Latinx	Community Member
15	F	W	Black/African American	Non-Latinx	Community Member
15	M	M	White/Caucasian	Non-Latinx	Community Member
17	F	W	Black/African American	Non-Latinx	Community Member
18	F	W	Black/African American	Non-Latinx	Community Member
19	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
20	F	W	Black/African American	Non-Latinx	Community Member
21	F	W	Asian	Non-Latinx	Biomedical Researcher
22	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
23	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher
24	F	W	Asian	Non-Latinx	Biomedical Researcher
25	F	W	White/Caucasian	Non-Latinx	Community Member
26	F	W	Eur-Asian	Non-Latinx	Biomedical Researcher
27	F	W	White/Caucasian	Non-Latinx	Biomedical Researcher

F = Female; M = Male or Man; W = Woman

Table 3:

Select Quotes – Meaningful Women's Involvement in HIV Cure-Related Research (United States, 2022)

Themes	Sub-Themes	Participant Number	Participant Type	Quotations
Inclusion of Women in HIV (Including Cure) Clinical Research				
Perceptions on Inclusion of Women in HIV Clinical Research				
Need to ensure broad representation by sex and gender		27	Biomedical Researcher	*Honestly, we've known for a long time that physiologically, men and women and people of different genders have different immune system, different physiologic biology of HIV in terms of their virus host interactions, they also have different socio-economic realities… So it's extremely important for us to involve many different types of people, including people of different sexes and genders.*
Need clear definition around sex or gender		12	Community Member	*Most of the research today is still done with binary gender in mind, male or female, and really doesn't capture some of the gender identity and expressions on the spectrum. I think that it's really important, if we are looking at these demographic informations, that we reflect accurate gender identity or gender expressions of participants. So in addition to transgender women, there are transgender men. Also, there are some who identify as non-binary, and they don't consider themselves on the spectrum*
Common Challenges to Including Women in HIV Cure Clinical Research				
Engagement and outreach-level challenges	Paternalism	19	Biostatistician	*There's a paternalism… And so women are never approached and not asked… the theme I have heard over the years when having the wonderful opportunity to hear members of the community… is, "I was never asked, I was never approached, I was never aware."*
Meaningful Participation of Women in HIV (Including Cure) Research				
Successful and Less Successful Clinical Trial Examples				
Successful examples	GRACE study	03	Community Member	*The GRACE study, done almost 15 years ago now, really demonstrated that it was possible to recruit women in the US in a treatment study. GRACE stood for Gender, Race, and Clinical Experience, which really resonated and meant something to women – to us. One of the amazing things about the GRACE study is that it enrolled nearly 70% women and 87% people of color. It was pretty astonishing in the US at the time and it really dispelled the myth that enrolling women domestically wasn't possible.*
Less successful examples	DESCOVY pre-exposure prophylaxis trial	18	Community Member	*Let's just be real and talk about what a tragic mistake and bad decision not including cisgender women in the DESCOVY trial was, right? … Now there's a whole new trial rolling out that is inclusive, actually has a separate track specifically for cis women, and had to have the inclusion of these women from the beginning, from before the protocol was finalized, before the protocol was written, submitted, and approved for study. All of that had to be done creating a whole different way of engaging the community so that there was accountability on top of the advisory work that's supposed to be done. And having more of a partner approach to how this study is going to roll out is what has happened as a result of not including women in the first place.*
Steps to Facilitate More Equitable Participation of Women				
Protocol-level solutions	Socio-behavioral and mental health component	18	Community Member	*It has to have a very robust social, behavioral and mental health approach to the overall enterprise for cure research. That it cannot just be about cells and drugs in bodies, that it really has to be understanding what cure means, how it might play out.*
Institution-level solutions	Representation at clinic level	01	Biomedical Researcher	*Representation matters. If we have a clinic where 90% of the doctor are white men, women will not be motivated to even*

Themes	Sub-Themes	Participant Number	Participant Type	Quotations
				show up and enroll. Having representation at every stage from the nurse to the doctor will be important.
Disaggregating Scientific Data by Sex and Gender				
Frequent mis-categorizations and misclassification by gender		16	Community Member	*People report a category of trans or non-binary, which, it's not disaggregating transgender men versus women. It's not disaggregating transgender or non-binary people. It's just kind of lumping them together into a category, which is not ideal, or that doesn't seem ideal to me. It would be far better to actually identify transgender men and women and non-binary people separately… One uses the term transgender spectrum. Just sort of lack of standardization of terminology.*
Testing Interventions in Women				
Sex is an important variable		22	Biomedical Researcher	*The data broadly indicates that sex is one host factor that will have to be considered, and it has top level implications for a bunch of interventions, including histone modification and latency reversal agents, which are impacted by estrogen in vitro potently, including anti-exhaustion therapies like anti-PD1 [programmed-death-1], which in the cancer literature have been shown to have sex differential efficacy, so one would predict that they might have the same difference in efficacy here. Then vaccines, which in that case, maybe females will do better, because female responses to vaccination are generally somewhat more robust. For block and lock, we really don't have much data… if it's silencing and it's histone modification or chromatin modification, there are lots of differences in how those are managed on the cellular level between male cells and female cells.*
Willingness to Undergo Invasive Procedures (e.g., Biopsies)				
Women willing to undergo invasive procedures	Adequate compensation needed	02	Community Member	*So one thing that I've learned about the HIV community is that the HIV community is willing to be involved in research to help the next person, right? If it's going to help the next person down the line, then I'm willing to do it. But presentation matters, compensation matters. I'm definitely not going to let you do a biopsy for a gift card. You can forget that. But if it's something that's going to make a difference for my family that I'm trying to take care of, then yes, I would consider it. So it depends on the woman. It depends on how the information is presented and it depends on the compensation and that's just as real as I know how to be about it.*
Deterrents	Prior physical abuse	14	Community Member	*She cannot have someone touching her body when she's asleep. Most of this is not even to do with the fear of that, but a lot of women have had abuses. They've had rape, they've been sexually violated and for some of them, these are triggers. These are issues that you need to talk about.*
People of Child-Bearing Potential				
Double barrier of contraception acting as a deterrent		09	Community Member	*One thing that always bothers me is when they request two forms of birth control. I think that's a little overboard for a lot of people. That's just not something that's going to happen when you're married and on birth control… I'm not going to go through the extra step and ask my partner to also put on a condom, because in addition to everything that we're already doing, I have to have two forms of birth control for this study… I don't have an issue with one form of birth control because I understand that you don't want anything occurring to the baby, but when they go to the two forms of birth control, that always irritates me a bit.*
Women and HIV Treatment Interruptions				
Women's Willingness to Interrupt HIV Treatment				
Willing to undergo HIV	Skipping pills occasionally	02	Community Member	*I actually was looking into a treatment interruption study… It doesn't have as much to do with the cure research as it does with me personally, which is that I've been skipping*

Themes	Sub-Themes	Participant Number	Participant Type	Quotations
treatment interruption				*pills anyway… I've been skipping just because of life. Life is doing what life is doing right now. And so for me, my thought was, "If I'm already missing medication, maybe I can get involved in this treatment interruption study." It benefits me because then I don't feel guilty about skipping my meds, but then it also benefits science because I'm participating in this research. So that again is how is it being presented, right? Or how are you asking me if I'm interested in this and are you listening to my reasons for why I want to be involved? … So that way, if I know that you're going to be checking my viral load and you're going to be watching out for what's going on.*
Not willing to undergo HIV treatment interruption	Ritualistic relationship with ART pills	10	Community Member	*I have to say, my relationship to my pills may be unusual in that I love my pills. I've had blessing ceremonies for my pills. When I take my pills, I see my friends in a circle, praying for me and my pills. So it's like I have a very consciously chosen choreographed relationship to my pills. And that's very unusual. Most people's relationship to their pills is… "This is a daily reminder that I'm stigmatized. This is a daily reminder that there's something wrong with me."*
Enrollment of Women in ATI-Inclusive Trials				
Need to understand partnership dynamics		02	Community Member	*I definitely feel like if you're going to involve a woman in treatment interruption, then you need to make sure what's her current partnership status. Does she have a partner? Is that partner HIV positive or negative? Is that partner on PrEP? What are their thoughts around U=U [Undetectable = Untransmittable] and the potential interruption of that? So there definitely needs to be a sexual health context and conversation, especially if the woman is in a sero-discordant relationship. So at that point, it's not just a woman conversation, it's a whole relationship conversation. What's her support system look like? If she has other family members that are heavily invested and involved in keeping her healthy, like say for example, in the Black community, we tend to be multi-generational as far as living arrangements, parents, grandparents, grandchildren. If my mother is living with me, is it going to freak her out to know that I'm not taking my medication? How do I have that conversation with her? So those are things that need to be considered. The overall lifestyle of a woman needs to be considered.*
Transgender and Gender-Diverse Individuals				
Role of hormones		07	Biomedical Researcher	*Inclusion obviously is the biggest issue, and being able to really answer questions around treatment interruption and cure research in this population, particularly, if they're taking hormone therapy, because it does seem like hormones are playing a role here in terms of the immunology and virology*
Needs for trauma-informed research		18	Community Member	*There's a certain level of built-in trauma, a desire to be seen, known, and felt as fully human, that people of trans experience have been denied mostly all their lives. Most people of trans experience at some point in their lives, if not most of the lives, have been denied that full recognition of their humanity… And come at me with that kind of compassion and empathy and humility and understanding and respect and see me and hear me in my full humanity. And then we can talk about the rest.*

Table 4:

Summary of Considerations for Increasing the Meaningful Women's Involvement in HIV Cure-Related Research

Inclusion of Women in HIV (Including Cure) Clinical Research

- **Inclusion of Women in HIV (Including Cure) Clinical Studies**:. Researchers should ensure broad representation, clear definitions, and accurate capture of gender identities. Inclusion can also be driven by the local and global epidemiology, scientific questions, and proactive enrollment goals.
- **Common Challenges to Including Women in HIV Cure Clinical Research**: There are multiple common challenges to including women in HIV cure research, including protocol-level challenges, medical and practical-level challenges, psychosocial challenges and institutional challenges. Research teams should prioritize to proactively reduce as many of these common challenges as possible, and design and implement HIV cure trials through the lenses of intersectionality.

Meaningful Participation of Women in HIV (Including Cure) Research

- **Successful Trial Examples**: The following were highlighted in some trials as successful tools in enrolling women in trials: the insistence and requirement to include women, respectful and holistic engagement of women, focus on scientific issues that matter for women, and trial design specific to a population aimed at answering a scientific question.
- **Steps to Facilitate More Equitable Participation of Women**:
  - **Protocol-level strategies** were including women in research planning stages, having more lenient eligibility criteria, preparing clear enrollment plans for women, setting very intentional enrollment goals and implementing enrollment freezes when necessary.
  - **Implementation strategies** include having frequent recruitment updates to research teams, reducing trial burdens as much as possible, and valuing women's unique lived experiences.
  - **Institution-level strategies** include involving sites that have adequate infrastructure and populations, recruiting women where they receive HIV care, involving primary care doctors, and having representation of women at all levels.
  - **Community engagement and outreach-related** strategies include involving peer navigators, outreach workers or case managers, involving community members and CBOs as partners, using simple language, and sharing research results back to the community.
- **Disaggregating Scientific Data by Sex and Gender**:
  - Data disaggregation by sex should occur as early as possible in the research process. There should be more standardized requirements for scientific abstracts and publications, and peer reviewers should recognize their role in making sure diligent reporting occurs. Data disaggregation is important to close scientific gaps and disparities, to help answer scientific questions, and to make people feel included in research.
- **Testing Interventions in Women**: Biological sex is an important variable when testing HIV cure interventions, particularly for host-directed therapies.
- **Willingness to Undergo Invasive Procedures (e.g., biopsies)**: Women may be willing to undergo biopsies, and several factors affect willingness to donate biopsies (e.g., information about why biopsies are needed, level of invasiness, frequency, level of pain or pain medications involved, sedation, recovery time, and compensation for biopsies and for research-related injuries).
- **People Who Can Bear Children**: People should be given autonomy to make decisions with informed consent, and there should be robust pre-clinical data to understand potential reproductive risks. Researchers should follow recommendations to make contraceptive requiremens more person- and women-centered (55) – for example, thinking carefully about these requirements for people from the LGTBQAI+ community.

Women and HIV Treatment Interruptions

- **Women's Willingness to Interrupt HIV Treatment**: Facilitators to HIV treatment interruptions included frequent clinical monitoring, helping ensure representation of women, and long-term side effects of study interventions. Potential ATI concerns were viral rebound, CD4 count decrease, inflammation, immune activation, health regression, contradicting ART adherence messages, having to relearn ART adherence after an ATI, changes in ART regimens, and challenges for women trying to conceive.
- **Considerations for Women Undergoing ATIs** centered around avoiding risks related to pregnancy and/or breast/chest-feeding, establishing relationships of trust and mechanisms for communication, involving primary care doctors in conversations, and adopting a holistic approach to ATIs (e.g., mental health checks). Considerations related to partner protections included understanding partnership status, offering adequate counseling and disclosure support, and adopting principles of trauma-informed research.

Additional Considerations

- **Logistical Aspects for Women**: Logistical considerations included offering transportation, childcare, customized support, flexibility with study visits (including home visits), meaningful financial incentives, minimized paperwork, birth control, mental health support, and linkages with CBOs who can offer wrap-around services outside of clinical trials if needed.
- **Transgender and Gender Diverse Individuals**: Attention should be paid to the role of sex hormones and gender-affirming care, as well as social factors (e.g., discrimination, stigma, stress, violence, economic vulnerabilities).