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The peer paradox: Perspectives from HIV service providers to inform the implementation of an enhanced social network strategy for black sexual and gender minorities—a qualitative study

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Abstract

Background The CDC's Social Network Strategy (SNS) is an evidence-supported approach to increase reach for HIV testing among members of marginalized populations. Leveraging social networks could improve access to HIV services, like pre-exposure prophylaxis and antiretroviral therapy, particularly for members of Black sexual and gender minority (BSGM) groups. We explored key barriers and facilitators prior to implementing an enhanced SNS (eSNS) to increase access to a broader range of HIV prevention and treatment services among BSGM in an Ending the HIV Epidemic jurisdiction in the US South.

Methods Guided by the Consolidated Framework for Implementation Research (CFIR), we conducted four focus groups with 19 HIV services staff members and 12 in-depth interviews with local health department officials, clinicians, and community-based organization leaders pre-implementation. Transcripts were coded by applying constructs from the CFIR and we identified themes about potential barriers and facilitators to implementing eSNS from potential implementers.

Results We identified three themes, each of which reflect a delicate and paradoxical balance between trust and mistrust that operates within social networks. Each theme represents a "Peer Paradox", wherein eSNS core components may have unpredictable effects on trust and mistrust within peer networks. The *Incentives Paradox* captures how financial incentives work synergistically with interpersonal ties to strengthen engagement with HIV services but also introduces a transactional element into peer-to-peer interactions. The *Readiness Paradox* is the perception that BSGM individuals best positioned to recruit peers who could most benefit from HIV services may require the greatest amount of additional support in delivering eSNS. The *Credibility Paradox* reflects a concern that although trust among peers may be harnessed to disseminate health information and increase acceptance of HIV services, peers may not be considered credible sources of HIV information.

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Conclusions Disruptions to the interplay of trust and mistrust within peer networks may influence the effectiveness of the eSNS intervention. These findings suggest that public health practitioners implementing SNS or similar social networking interventions should identify and address specific obstacles to fostering trust before and during implementation. We recommend considering strategies that address peer credibility, readiness, and the impact of financial incentives in social network interventions.

Keywords Social network strategy, HIV prevention and treatment, Sexual and gender minorities, Peers, Consolidated Framework for Implementation Research, Trust

Contributions to the literature

- Applies the CFIR framework to a social networking intervention model where an informal, non-professional role is central to implementation and delivery in a public health organization setting
- Demonstrates that the enhanced Social Network Strategy will need to be adapted and enhanced to leverage trust within social networks of BSGM
- Perspectives from local public health leaders and staff with client-facing roles offered critical insight into considerations for eSNS adaptation and implementation.
- Describes recommendations to enhance acceptability and adoption of social networking models for HIV services in public health and community organization settings

Background

The US *Ending the HIV Epidemic* (EHE) initiative emphasizes using equity and community-specific strategies to reduce new HIV infections by 90% by 2030 [1]. Social and structural factors (including stigma, discrimination, and reduced access to HIV services) result in persistent racial, gender, and geographic inequities and a disproportionate number of new diagnoses among Black sexual and gender minority (BSGM) individuals [2]. In 2022, most new HIV diagnoses occurred among gay and bisexual men (70%); of those, 34% were Black/African American [3]. Transgender women accounted for 2% of new HIV diagnoses in 2019, yet only ~0.3% of the population, and most were among Black/African American Transgender women [4]. In addition, the US South accounted for 52% of all new diagnoses, and North Carolina ranked ninth for new diagnoses by state [5]. Strategies are needed to improve testing, HIV case detection, and reduce new diagnoses among BSGM [6], including uptake of pre-exposure prophylaxis (PrEP).

The Centers for Disease Control and Prevention (CDC)'s Social Network Strategy (SNS) is an "evidence supported intervention" [7] to motivate individuals to test for HIV [8–12]. Demonstration projects established SNS effectiveness to increase HIV testing among Black men [11], including in the US South [10]. SNS programs coach people with HIV or with reasons to test ("recruiters") how to recruit their "network associates" or peers (e.g., friends or partners) for HIV testing. Unlike peer-educators or community health workers, their role is short-term. Although many community-based organizations (CBOs) have implemented SNS, we designed an enhanced SNS (eSNS) program embedded within Partner Services, planned to be delivered at a health department. Partner Services [13] encompasses a range of services provided by Disease Intervention Specialists (DIS) for people diagnosed with HIV or other sexually transmitted infections (STIs), including voluntary partner notification and linkage to prevention and care.

A recent systematic review used the Consolidated Framework for Implementation Research (CFIR) to identify implementation determinants cited in research related to HIV testing and linkage-to-care in the US [14]. Only 7% of 186 reviewed studies were reported within a health department delivery setting [14]. A plurality of determinants across studies were identified in the *inner setting* (38.82%) which included challenges due to structural characteristics of organizations and work infrastructure, among others.

Within SNS, peers may face unique barriers to sustained delivery of HIV interventions, such as job burnout, insufficient training and emotional support, challenges with task-shifting, and stress navigating disclosure of their HIV status or sexual identity [15]. Previous studies of SNS have also reported factors influencing implementation and effectiveness, e.g., unintended consequences of incentives among peers and staff deviating from the protocol to diversify incentives [8]. Additional staff burdens may include training, increased responsibilities, and task-shifting despite a low yield of new HIV diagnoses, which may lead to high turnover rates [10, 11]. A recent review of SNS to optimize HIV testing also identified incentives, trust among peers, stigma, partnerships with community organizations, and well-defined implementation plans for training and supporting staff, particularly to confirm HIV diagnoses [16]. Many identified implementation barriers can be addressed through implementation

strategies that focus on organizational support (e.g., policies for flex time to improve retention) [15]. Engaging with potential implementers in the setting of SNS delivery prior to implementation, such as health department staff, is critical to embed SNS within existing organizational programs and policies given these previously identified staff challenges [16]. Although SNS is promising, further research is needed to identify implementation determinants prior to implementation from deliverers and recipients.

We adapted the original CDC SNS intervention to include linkage to any HIV care or prevention service and modified SNS terminology: people coached to recruit members of their social networks are *Ambassadors* (instead of *recruiters*) and they recruit their *peers* (instead of *network associates*). DIS who coach Ambassadors through eSNS are called *Coaches*. Integrating our eSNS with Partner Services may more efficiently engage members of social or sexual networks with recent HIV transmission (i.e., networks with members who were diagnosed within the past 12 months). DIS identify BSGM members of recent transmission networks and coach them to recruit their peers for HIV services.

We report on formative results from Phase 1 of our hybrid Type 1 effectiveness-implementation study designed to evaluate eSNS (the next study phase will evaluate eSNS effectiveness and the intervention delivery process) [17]. Prior to implementation, we used the CFIR to anticipate potential facilitators and barriers to eSNS from the perspectives of HIV service providers working in the inner setting, who may influence implementation outcomes [18]. The intervention aims to increase BSGM groups' engagement in HIV testing, PrEP use, and HIV care. We elicited perspectives from HIV services providers to understand how potential coaches (DIS) and their supervisors perceived barriers and facilitators to adapting and implementing the eSNS program due to their critical influence over recruiting and coaching Ambassadors. The current study describes potential implementation determinants identified by HIV service providers in an EHE jurisdiction in the US South.

Methods

Study design and setting

During the formative phase, we used CFIR to develop in-depth interview (IDI) and focus group discussion (FGD) guides to explore barriers and facilitators to implementing eSNS from the perspectives of potential implementers in Partner Services in a Southern EHE jurisdiction. We follow the Standards for Reporting Qualitative Research (SRQR) to increase the transparency of this qualitative research (Supplementary Files 3 and 4).

Recruitment

We purposively recruited HIV service providers to participate in IDIs and FGDs through the investigators' networks by email invitation to county health department leadership, local CBOs, and clinics. FGDs and IDIs were conducted in English from December 2022 to February 2023.

Four FGDs of 4–6 participants included 19 staff from the local health department or CBOs (9 case managers, 8 HIV/STI DIS/public health field investigators, and 2 supervisors of Partner Services and/or linkage to care programs) providing direct services to clients. Three of four FGDs included at least one CBO staff member; participants' time in their current roles ranged from less than 1 to 15 years. Focus group participants were selected to minimize potential differences in hierarchy by selecting participants with similar roles and expertise. Due to potential power imbalances, IDIs were conducted with 12 participants in leadership roles (5 public health departments, 4 CBOs, and 3 local clinics) who did not participate in focus groups (Table 1). None of the participants in focus groups or interviews would act as Ambassadors, however some could supervise or act as Coaches during regular Partner Services activities.

Data collection

Following informed consent, all IDIs and FGDs were conducted via secure video conferencing by study team members trained in qualitative data collection. Only audio recordings were collected. FGDs lasted approximately 90–120 min during work hours and participants were not compensated. Interviews lasted 60–90 min and participants received a $50 gift card. Audio files were transcribed and organized using NVivo Release 1.7 by QSR International.

Interview guides

To explore perspectives of the planned eSNS prior to implementation among field services staff who could deliver the intervention as Coaches, the FGD guide explored CFIR domains of intervention characteristics, inner setting, outer setting, and process. Because IDIs were conducted with leadership, the interview guide focused on the intervention characteristics and process domains. Questions from both guides are presented in Supplemental Material 1. Toward the end of IDIs and FGDs, participants were provided with a visual schematic of eSNS phases (Supplemental Material 2). The eSNS intervention, like the CDC's SNS, compensates Ambassadors for each peer recruited to HIV services. Peers will be compensated for completing an HIV service. Interviewers shared hypothetical descriptions of potential

Table 1 Characteristics of Interview and Focus Group Participants

Characteristics		%	N
IDI Participants **(n = 12)**			
Gender			
	Female	66.7%	8
	Male	33.3%	4
Age	Median (range)	47	(28–66)
Race			
	White	58.3%	7
	African American/Black	41.6%	5
Ethnicity			
	Non-Hispanic/Latino	91.6%	11
	Hispanic/Latino	8.3%	1
Position Title			
	Organization Leader	41.7%	5
	Program Manager	33.3%	4
	HIV Care Provider	25%	3
Practicing Clinician			
	No	66.7%	8
	Yes	33.3%	4
Time in Current Role (years)	Median (range)	3.5	(1–13)
Professional Experience (years)	Median (range)	18	(10–40)
FGD Participants **(n = 19)**			
Position Title			
	Case Manager	52.6%	10
	DIS	42.1%	8
	Program Manager	5.3%	1
Time in Current Role (years)	Median (range)	1.5	(< 1–4)
Professional Experience (years)	Median (range)	13	(4–25)

eSNS procedures (e.g., Ambassadors could participate for approximately four weeks and receive $20 per peer referral).

Qualitative analyses

IDI recruitment continued until data saturation was indicated by new data that repeated earlier findings [19]. FGDs were not stratified and data were closely monitored during data collection using constant comparison, to assess for general saturation on core eSNS implementation topics and to identify across-group saturation [20, 21]. Thus, we determined saturation for FGDs using an emergent design as group perspectives continued to identify the same barriers and facilitators to eSNS.

To apply a priori codes, three pairs of coders used the updated CFIR [18] as the primary coding framework, organizing the data by salient constructs and subconstructs per domain. The final codebook, developed iteratively to achieve consensus, included both inductive and deductive codes and was applied to both FGD and IDI transcripts. Two separate groups of coders independently coded one FGD and IDI transcript, performed inter-rater reliability checks in NVivo, and met to discuss and resolve any discrepancies.

Thematic analysis guided by Braun and Clark's approach [22] was used to analyze coded data regarding perceptions of the eSNS intervention. Three analysts grouped data coded with CFIR domains (deductive codes) and non-CFIR constructs (inductive codes) into potential barriers and facilitators, discussed themes, and iteratively drafted and discussed analytical memos to increase credibility. Subsequently, MCZ and ID met to organize findings into salient overarching themes mapped to the CFIR domains. Representative quotes were modified for brevity by removing pause words or repeated phrases.

Results

We developed a conceptual model named the *Peer Paradox* (see Fig. 1) to illustrate participants' ambivalence about the effects eSNS delivery may have on trust among peer networks. Although participants viewed eSNS as a positive, innovative, and potentially effective tool, they expressed mixed feelings on leveraging peer relationships, which may build upon or erode peer trust.

Within the Peer Paradox conceptual model, we identified three themes that may influence the effectiveness of eSNS and the implementation. Mapped to salient constructs from CFIR, these three themes cross the Innovation Source, Inner Setting, Outer Setting, Individuals, and Implementation Process domains (see Fig. 2). First, participants perceived that providing financial incentives to Ambassadors and their peers may work synergistically with Ambassador-peer relationships to encourage increased engagement in HIV services. Participants expressed concerns that compensating Ambassadors for each peer linked may infuse a transactional layer into their relationships, an ambivalence we call the *Incentives Paradox*. Second, participants anticipated that Ambassadors from priority groups, such as young men recently diagnosed with HIV, may be well-positioned to recruit peers from communities experiencing recent HIV transmission but may require the greatest amount of support from Coaches. We explored participants' reasons for this perception, including stigma, under what we call the *Readiness Paradox*. Third, the *Credibility Paradox* denotes participants' concern that Ambassadors may not be perceived as credible sources of information about

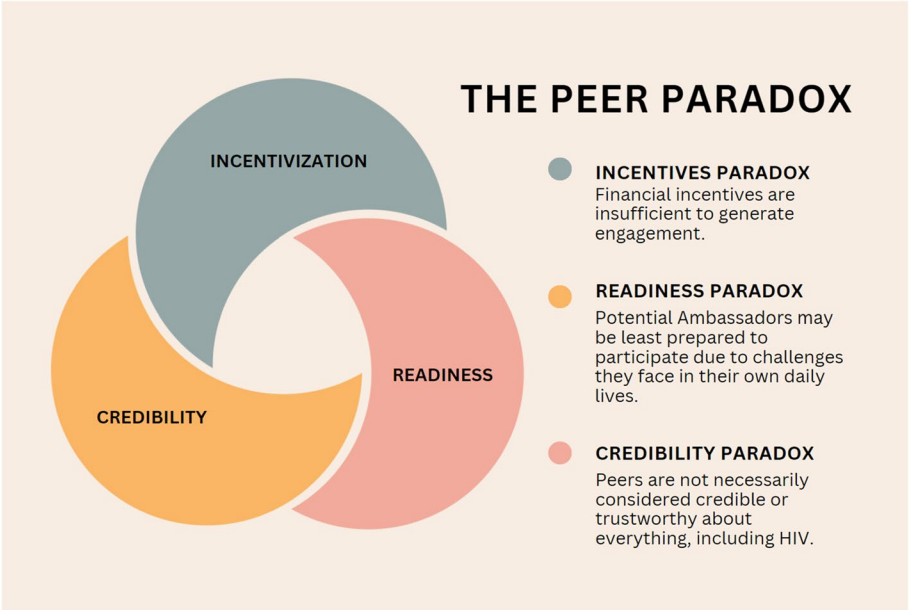

Fig. 1 The Peer Paradox is the delicate balance within social networks predicated upon trust

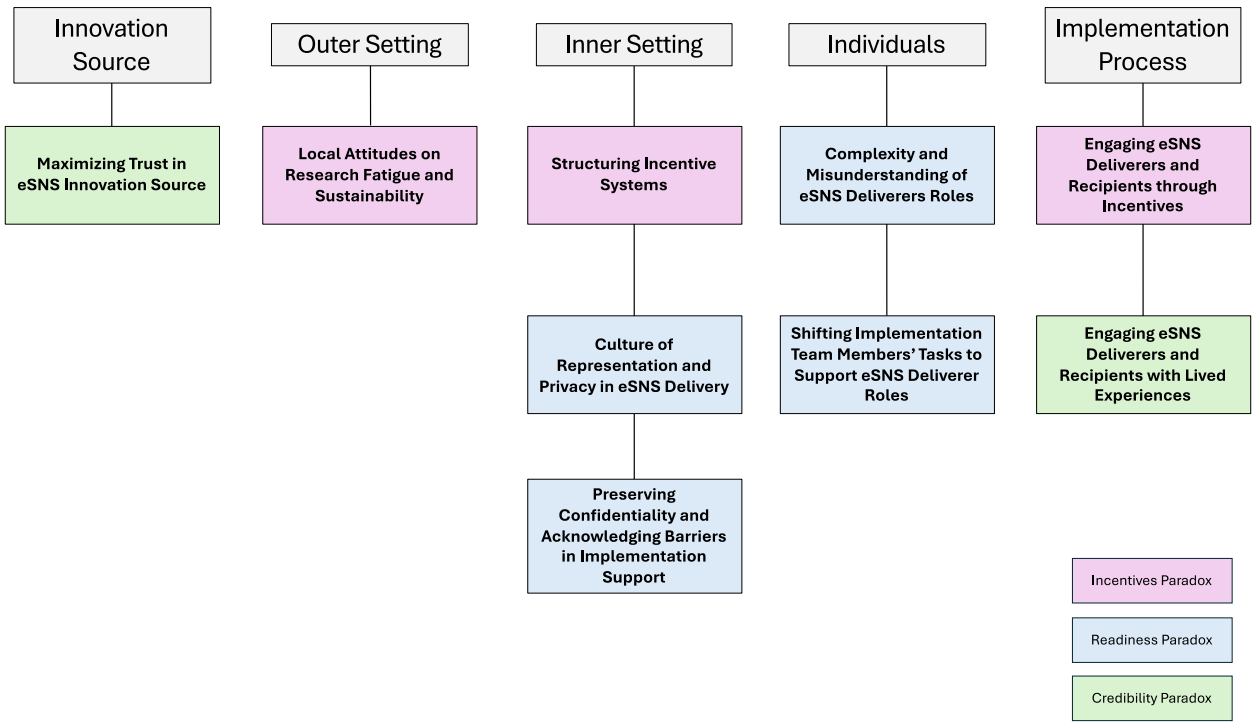

Fig. 2 Select CFIR Constructs Mapped to Cross-Cutting Peer Paradox Theme

HIV and local services, even if peers trust them to better understand their life experience. Social network strategies (including eSNS), which require leveraging trust to deliver the intervention, may disrupt network trust. Below, we present three themes exploring peer trust as a potential barrier and facilitator with illustrative quotes.

Theme 1: Financial incentives alone are insufficient to generate participant engagement in eSNS and may erode trust between peers (Incentives Paradox)

Participants concurred that small financial incentives are insufficient to engage deliverers (Ambassadors) or recipients (peers) in eSNS. While financial incentives may attract interest in eSNS engagement, participants anticipated that positive interpersonal relationships with the implementation team (Coaches) would be more important to Ambassadors and their peers.

Inner setting: Structuring incentive systems

Participants expressed divergent opinions about the net effectiveness of integrating a system of financial incentives into eSNS implementation. Some felt incentives could support delivery of eSNS generally as either an economic benefit for Ambassadors or to motivate Ambassadors by making their role, as one DIS put it in FGD #4, "*goal-driven*". Conversely, as a case manager cautioned in FGD #3, some felt that incentives may be counter-effective, because "y*ou'll just get people coming in just to get the incentive and not—really following through*".

When discussing how to provide incentives over time, one case manager suggested that staggering incentives for tasks completed could sustain eSNS Ambassadors' motivation. A health department program manager shared this opinion, noting that this could make Ambassadors' engagement "*kinda ingrained*". Participants noted that prolonged compensation raised concerns about primarily financial motivation. One public health department program manager commented, "*[I]f they're seeing this as more of an opportunity for making money as opposed to getting their social network linked to the services—then that could be a problem.*"

An incentive system could habituate eSNS Ambassadors and peers to receiving incentives, clashing with what participants saw as the most important method of engaging them: fostering rapport with Coaches. Thus, incentives should be "*a little thing*" and not the primary motivation for participation:

> *The engagement is that rapport you established with that person, you know, on a one-to-one, being nice, being available, being this, that. You know, it shouldn't even really be about an incentive. An incentive is kinda like just a added little thing, you know, 'cause again, I just think human behavior—we're just gonna get used to receiving that or-or, you know, and of course, the word is gonna spread. (Health Department Case Manager, FGD #3)*

Implementation Process: Engaging eSNS deliverers and recipients through incentives

The Ambassador's role in eSNS straddles the CFIR's constructs of *innovation deliverers* and *innovation recipients*. Ambassadors *receive* coaching (and compensation) to learn their role in eSNS, yet also *deliver* information, resources, and support to peers to implement HIV service referrals. Consequently, financial incentives are one implementation strategy to engage Ambassadors in short-term deliverer roles. One health department case manager in FGD #2 envisioned financial incentives would promote Ambassador's eSNS participation as deliverers over time ("*[Y]ou may see some growth, especially if you're incentivizing*").

Participants prioritized tailoring the amount or type of financial incentives to BSGM needs. A health department case manager in FGD #4 connected needs to extrinsic motivation, explaining incentives could "*make this population a little bit more interested in participating if it's something geared to what they need on a daily basis.*" Paraphrasing a hypothetical Ambassador, a CBO case manager described how incentives are a necessary but insufficient engagement strategy because many BSGM may require additional support to face daily challenges.

> *…it's basically like a "Okay. So, you want me to help you. Well, how are **you** gonna help **me**?" "Um, are there incentives?" "Or how do—how would you like me to help you?" And "I still have barriers to care. I need you to cover all of this before I jump in for you headfirst. […]" (Case Manager, FGD #1)*

Besides being inefficient, incentives may place additional strain on trust among peers. One CBO leader, who provides HIV clinical services, expressed concerns that offering incentives could result in perceptions that Ambassador's are capitalizing on peers for financial gain, eroding trust. The impact of being perceived as "*sneaky spies*" for financial gain could be mitigated by transparent communication:

> *[L]ike is there any trust erosion there? If you're, like, a-another peer saying like, "Hey. Do you wanna get this tested?" Well, they're-they're not just looking out for their good will, they're also getting paid. [...] So-so it might be fine as long as there's some transparency that that person who is asking the peer to get tested, or get involved in services, is transparent with the fact that they are receiving compensation for this. Um, it-it just feels kinda sneaky. (Organization Leader/HIV Care Provider)*

Outer setting: Local attitudes on research fatigue and sustainability

Some CBO leaders saw research fatigue as an eSNS barrier because BSGM have "*been saturated, um, with testing, um, care, you know, all of these different types of invent—interventions.*" Incentives may be less attractive due to fatigue surrounding the high volume of local HIV studies. One CBO leader described how ebbing financial systems have created research fatigue and impeded sustainability:

> *"… they, in the African American MSM population, they already feel as though I'm your guinea pig. I'm always your number, you come to me for everything when it comes to sexually- sexual health. But then, when the money dries up or you get the numbers that you want, you no longer need me until the next time. And so there's got to be, we have to do better with that. Um, what does that sustainability looks like." (Organization Leader)*

Theme 2: Optimal eSNS Participants May Require the Most Support (Readiness Paradox)

Our eSNS is tailored towards networks with recent HIV transmission among BSGM who are historically marginalized and underserved. Participants described the perception that potential Ambassadors who are well-positioned to act as a bridge to HIV services among their peers may be least prepared to recruit peers due to their own daily challenges.

Individuals: Complexity and misunderstanding of eSNS deliverers roles

Ambassadors are not formal implementation team members but are critical because they refer peers to HIV services. eSNS Ambassadors are recruited from social networks experiencing recent HIV transmission, but the Ambassador role is HIV-status neutral [23]. Several participants shared concerns that individuals from within recent HIV transmission networks are not ready to assume the Ambassador role's elevated social visibility. A common misunderstanding among participants was that the Ambassador must be a person recently diagnosed with HIV, which may reflect the role's perceived complexity. One DIS in FGD #1 anticipated that since "*HIV is still very much stigmatized*", the pool of willing potential Ambassadors would be limited, because "*[p]eople really don't wanna put themselves out there like that.*"

Although eSNS Ambassadors are not required to be recently diagnosed, participants indicated that enrolling younger Ambassadors could be a "*big ask*" at a time when BSGM may still be learning about their personal identities, including gender or sexuality. Moreover, compared to cisgender men, transgender women may be receptive to assuming the Ambassador role because of their prior experiences of stigma, exclusion, and discrimination, which have created conditions where "*they're used to relying on each other*". A CBO case manager described how younger BSGM clients may need additional education, training, and support before becoming Ambassadors:

> *Um, so those are barriers I see. Just people being people. And not really fully knowing themselves yet, still learning about themselves, learning about the condition, learning about their identities, their orientations. And then them growing and evolving in that regard and asking them to impart wisdom on someone else. Yeah. I think that would need a lot of education and a lot of support. (Case Manager, FGD #1)*

The eSNS intervention is designed to operate as a cycle, with Ambassadors recruiting peers (some of whom may become Ambassadors). Thus, the first wave of Ambassadors may generate a positive feedback cycle; the associated implementation challenge, concerning readiness, may be enlisting a critical mass of effective Ambassadors capable of initiating that cycle. An ideal Ambassador may be a peer who recently participated in eSNS:

> *If we get somebody who is already, you know, uh, have gone through this and know what's going on, I think that is a key to being able to, um, uh, identify and reach people and-and return them into care, and/or get tested, um, for possible PrEP [...] peer support, is vital into getting—to breaking the barriers, and being able to help, um, with some of the stigma and-and things that are going on right now. (DIS, FGD #1)*

Inner setting: Culture of representation and privacy in eSNS delivery

Participants indicated that Coaches and Ambassadors should be representative of BSGM. As one DIS in FGD #3 put it, "[*I]t's, like, really tough for me personally to kinda relate to people 'cause they're like, 'You're young. You're a woman. You're white. Like, you really don't understand my situation*'". Another DIS in the same FGD described how involving BSGM on the implementation team could enhance trust more effectively than staff who do not share similar lived experiences:

> *" … so I just feel like having that person who is in their circle and who can identify with them— and make those referrals is definitely a, um, a better-a better method and, um, more incentive to actually engage in these services."*

Participants anticipated privacy as another important need for Ambassadors and peers. Participants described a generalized mistrust among clients who, as DIS in FGD #1 and FGD #4 put it, perceive local public health department staff as "*the sex police*". DIS described how clients raised privacy concerns after learning how personal information is recorded in state surveillance databases:

> *... in my experience, just talking to people who have recently been diagnosed, they'll be like, "Well, how did you get my name and number?" And I'm—and I tell them about the North Carolina Disease Surveillance System, and they're just like, "I had no idea you all were keeping a record." And a lot of people feel like, you know, we're keeping a list. (DIS, FGD #1)*

Inner setting: Preserving confidentiality and acknowledging barriers in implementation support systems

Several participants envisioned how Ambassadors could break down social barriers and HIV-related stigma by talking about HIV with peers and developing or relying on trust and rapport. A DIS in FGD #2 stated that promoting conversations about HIV among peers "*would also help remove a lot of biases and a lot of stigma if people are more open*". Throughout FGDs, participants highlighted a delicate balance between the benefit of transparency between Ambassadors and peers and the importance of confidentiality. One DIS anticipated that the need to maintain confidentiality could strain the Ambassador's capacity to support a newly diagnosed peer, who may need additional support following a diagnosis:

> *I definitely think there could be, like, some sticky situations with, like, confidentiality and with the trainings and making sure that they get the proper training. [..] like, HIV counseling and stuff like that, so that's where it kinda gets into, like, a gray area of, like, how involved these [Ambassadors] might be. (DIS, FGD #3)*

While stigma reduction may result from leveraging peer support within the eSNS intervention, concerns expressed among participants suggested that people best suited to recruit their peers may need resources and support from Coaches and Ambassadors to navigate challenges of stigma, confidentiality, and peer support. As a CBO leader summarized, successfully implementing eSNS within Partner Services depends on "*pick[ing] those right [Ambassadors] and the right [Coaches] to be involved and engaged*".

Knowledgeable Ambassadors may be well-positioned to anticipate peers' barriers, however they may experience barriers that hinder engagement, such as transportation, access to phones, and employment challenges. Thus, potential Ambassadors may be unlikely to participate due to ongoing systemic factors (which could create challenges recruiting peers):

> *[Y]ou may wanna start with individuals that are stable; they have stable housing, uh, food security... Uh, they're-they're adherent to their care... They can be somewhat of a role model, uh, as a recruit. That someone-that someone would look at and say, "Hey. I wanna be just like them...." (Case Manager, FGD #1)*

Individuals: Shifting implementation team members' tasks to support eSNS deliverer roles

Coaches are best described as "Implementation Team Members" [18]. Aligned with the idea of the Coach as "*extra support from the program to be able to call in a moment's notice*," as one health department case manager put it during FGD #3, several participants positively perceived the potential for a Coach to shift DIS outreach tasks to an Ambassador.

> *...if I have someone, and they're comfortable calling their partners on their own, um, it makes the process so much easier because they're—they'll tell their partners, "Hey. [Name]'s calling from the health department. She wants to get you in. She wants to get you tested and treated..." And that makes the process so much easier, um, 'cause the-there's a little bit of gatekeeping with certain communities. (DIS, FGD #4)*

FGDs participants emphasized the importance of establishing a formal support model between the Coach and Ambassador. Serving as a reinforcement, the Coach provides the Ambassador with credible information about HIV services to share with their peers. A health department program manager explained during FGD #1 that "*I think the peer would be good to be the forefront but have someone a little more official in the background to say 'Yes. This-this information they're giving you is-is accurate.*'" Concerns about Ambassadors' readiness to recruit peers may be partially assuaged by establishing practices based in exchange of accurate information verified by Coaches. Task-shifting typical DIS responsibilities, including Ambassadors referring social network members, may mutually reinforce contact tracing efforts and may increase eSNS acceptability eSNS among implementation team members.

Theme 3: Potential recipients of eSNS may not trust health related information solely from DIS or from their peers (Credibility Paradox)

Although trust may be harnessed within social networks among people who share similar experiences or identities, participants suggested that peers are not always considered credible or trustworthy, despite shared life experiences. Peers may be trusted, but not entirely, for different reasons.

Innovation: Maximizing trust in eSNS innovation source

As a CBO leader who provides HIV clinical care stated, HIV messaging may resonate better when stories are shared by people with similar lived experiences with "*the system, the provider, the medication*". One health department program manager described how her experience at work being viewed as a "*stranger*" may contrast with what Ambassadors encounter among peers:

> *"I can tell clients 'til I'm blue in the face,"You cannot get HIV this way."But if their best friend that they've known who lived down the street for years and years and years tells them that, I think that's gonna make a big difference. I think that is the education piece, the fact that it's people that others are familiar with. It's not a stranger coming in and saying, you know,"I've got your lab work and your name was turned in and we need to get you tested."You know, like DIS kind of does." (Program Manager)*

Ambassadors may circumvent existing mistrust of public health workers. Support from Ambassadors may be critical to link recruited peers engaged in eSNS to HIV services because they can be an "*advocate for that social circle or for whatever community they may represent"* rather than an *"outsider coming in"* (DIS, FGD #3). Despite this advantage, several participants cautioned that even when an eSNS Ambassador has established trust with a peer, that level of trust may be limited in scope. One program manager weighed how peers may be more receptive to someone "*who looks like them, or understands them more, or are a part of the community".* Simultaneously, peers may raise questions about an Ambassador's credibility in providing health information, questioning *'"Well, is this information accurate?" or "Who said this?" or "My homegirl said this. My homeboy—".* An organization leader summarized how trust in the perceived innovation source may be contingent:

> *I mean of course there's always pros and cons to having people with lived experiences. Sometimes people may not want to disclose or they may not wanna work with somebody who has lived experiences. So that can be a disadvantage. And sometimes people just may wanna be left alone to navigate the process on their own, you know. So it can be a win. It can be a challenge. I mean it just—it just depends. (Organization Leader)*

Implementation process: Engaging eSNS deliverers and recipients with lived experiences

Participants perceived the relative advantage of eSNS to engage people with lived experiences to access HIV services by drawing upon existing trust with their peers. One participant had mixed opinions about the process of implementing eSNS among the close-knit BSGM community in which peers may not always be trustworthy:

> *…I'm a part of the MSM community. We're here. We-we are present…. And we-we have a good number, but it's still big but small. So, like, hey, now I have two or three or four people coming to me about X, Y, and Z. "Can I trust you?" […]how do you know you're not going to, now we're a part of this network, you're not gonna spill the beans and play telephone and push everything down to—you know—to everyone else? (Program Manager, FGD #1)*

Discussion

Increasing access and uptake of HIV services among BSGM groups is critical to ending the HIV epidemic in the US South. We explored potential barriers and facilitators to implementing our enhanced social network strategy (eSNS), which we plan to implement in a health department setting, from the perspectives of public health leaders, clinicians, and health department and CBO staff who provide HIV-related services. The *Peer Paradox* conceptual framework reflects the precarious balance of trust operating in BSGM social networks. By leveraging peer trust, social network interventions may simultaneously apply pressure to existing trust among peers in ways that can serve to either hinder or facilitate intervention delivery. The Incentives Paradox, Readiness Paradox, and Credibility Paradox each demarcate three distinct pressure points participants perceived could have these differing and paradoxical effects on social network trust.

Participants indicated that providing financial incentives should coincide with strategies to foster rapport (the *Incentives Paradox*). Although incentives may increase eSNS engagement, they may erode trust if peer relationships become transactional. Previous SNS studies have used incentives with varying degrees of success; several documented the challenge of incentive-seeking as a primary motivator for participation [16]. While

incentives increase recruitment and testing among peers [8, 24], they can result in unintended repeat participation [25] and amounts may need to be adjusted to meet the needs of participants [26]. We recommend aligning incentives systems with participants' needs (i.e., cash, gift cards, transportation vouchers, etc.) while Coaches apply rapport-building strategies. Research fatigue and stigma in the Outer Setting suggests that alternative community engagement methods beyond incentives are necessary. Consistent with previous findings [16], training eSNS Coaches to build rapport with Ambassadors and peers, linking them to community-based resources and services, and partnering with local CBOs, who have stronger community connections than health department staff, may increase buy-in from potential eSNS Ambassadors and their peers.

Within the *Readiness Paradox*, we found that although Ambassadors serve in an integral eSNS role, they may not be sufficiently prepared to support their peers. This conflict may be mitigated by fostering an Inner Setting culture that balances representation, confidentiality, and privacy. Previous studies (not only among BSGM) have documented the importance of trust among network members [25], concerns about confidentiality, disclosure of HIV status [9], and pre-existing stigma as a persistent barrier to testing [10, 25]. Like their peers, Ambassadors face structural determinants to service engagement (e.g., discrimination related to HIV status, PrEP use, or gender and sexual identities). Therefore, Ambassadors who are ideally suited to recruit their peers may themselves need additional support from Coaches, particularly if they are younger, newly diagnosed [27], experience multiple forms of marginalization, or are still developing the full complexity of their identities.

Conversely, eSNS may be more acceptable in settings with heavy caseloads [28] or among health department staff who do not share lived experiences or identities with the communities they serve because the Ambassador role is perceived as shifting tasks away from DIS (like contact tracing). Participants suggested that the eSNS implementation team should carefully select initial Ambassadors to recruit peers, in line with previous studies that recommended identifying network members who are most influential [29, 30]. Studies cautioned that early adopters may not be the most influential or deeply embedded within networks [29, 31].

Ambassadors may stretch the limit of their credibility with peers, as described in the *Credibility Paradox.* Effectively communicating the Coach's role on the implementation team (supporting the Ambassador and providing credible information) may alleviate this concern. A recent scoping review found that paraprofessional roles like eSNS Ambassador may be challenging because of reduced trust among peers, competition, and misunderstandings of roles [32]. Developing and fostering trust to ensure credibility entails long-term and strategic partnerships in the community. Ambassadors may need to be carefully selected and engaged in sensitivity training during program orientation to maintain confidentiality.

Implications. Trust can be leveraged for public health strategies like eSNS. However, incentives, lack of readiness, and inadequate credibility may inadvertently disrupt fragile webs of trust among social networks. Introducing eSNS among BSGM communities may compound pre-existing pressures on trust, including research fatigue and multiple marginalization. Outer setting factors may then be exacerbated by the short-term engagement of peer facilitators like Ambassadors. Understanding the local context among BSGM groups may improve an implementation team's ability to leverage local community resources. For eSNS, we will employ an array of implementation strategies [33], such as inviting former Ambassadors to join our advisory group and training and supervision of Coaches and Ambassadors to confront the potential stressors of peer-led interventions with short-term roles. Sustained community and participant engagement and purposeful monitoring of implementation will allow implementers to modify financial incentives and develop tools to assess impacts on trust.

Strengths and limitations

Potential implementer perspectives are essential to understand the local implementation context, including resources and challenges experienced among BSGM groups that extend beyond HIV services. Although some participants identified as BSGM, HIV services providers' perceptions of eSNS implementation barriers and facilitators may not represent the views of potential eSNS Ambassadors or peers (i.e., BSGM in recent transmission networks). It is possible participants' roles, responsibilities, and positions may bias their perspectives of eSNS implementation, including anticipating how eSNS may fit into their workflows or engage newly diagnosed patients. To verify the hypothesized impact of these "paradoxes" within BSGM social networks, future studies will present findings from eight in-depth pre-implementation interviews with potential Ambassadors and six planned interviews with Ambassadors post-implementation. During eSNS implementation we will also survey the implementation team to understand eSNS from the perspectives of DIS and their supervisors and invite all Ambassadors to participate in a graduation survey after completing peer outreach. We will triangulate findings from qualitative and quantitative data sources to enrich our evaluation of eSNS's acceptability, feasibility, and appropriateness. Given the formative nature of this study, interviews posed

hypotheticals or interviewers could not effectively clarify participant questions about intervention procedures (i.e. CFIR's Inner Setting, Outer Setting, and Innovation domains). Finally, we encountered analytic challenges applying the updated CFIR to our eSNS design, as Ambassadors' short-term role spans the CFIR's *innovation deliverers* and *recipients* constructs. Nevertheless, our results may be transferrable to other EHE jurisdictions planning to implement eSNS or similar strategies.

Conclusions

Enhanced Social Network Strategy (eSNS) is an innovative approach to increase access to HIV services among BSGM. The "Peer Paradox" illuminates the critical and challenging task of building trust during peer-based interventions. Our findings caution to anticipate and guard against potential unintended consequences during eSNS implementation. The perceived relative advantage of leveraging trust within peer networks (including appropriateness and alignment of forms of incentives) to deliver eSNS may also disrupt trust and reduce eSNS effectiveness. Future social network-based interventions should identify and mitigate obstacles to fostering trust prior to and during eSNS implementation.

Abbreviations

eSNS	Enhanced Social Network Strategy
DIS	Disease Intervention Specialist
CDC	Centers for Disease Control and Prevention
CFIR	Consolidated Framework for Implementation Research
PrEP	Pre-exposure prophylaxis

Supplementary Information

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Additional file 1.

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Authors' contributions

AD, MCZ, CG conceived and designed the study. MCZ and ID analyzed and interpreted the data, drafted, and revised the final manuscript. AD interpreted the data and substantively revised the final manuscript. EO designed qualitative guides, conducted interviews/acquired data, led coding and analysis, interpreted findings and wrote original results summaries, substantively reviewed and contributed to the manuscript. ME and JM acquired the data, contributed to qualitative analysis, and assisted with results. MZ acquired the data and substantively revised the final manuscript. PR and JE substantively revised the manuscript. All authors read and approved the final manuscript.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All participants provided informed consent to participate in this study. This study was approved by the Institutional Review Board at the UNC Chapel Hill [IRB #22–1988].

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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References

1. CDC. Ending the HIV Epidemic in the US (EHE). 2024. Ending the HIV Epidemic in the US Goals. Available from: https://www.cdc.gov/ehe/php/about/goals.html. Cited 2024 Aug 15.
2. CDC. HIV. 2024. Fast Facts: HIV and Gay and Bisexual Men. Available from: https://www.cdc.gov/hiv/data-research/facts-stats/gay-bisexual-men.html. Cited 2024 Aug 15.
3. CDC. HIV. 2024. Fast Facts: HIV in the United States. Available from: https://www.cdc.gov/hiv/data-research/facts-stats/index.html. Cited 2024 Aug 15.
4. CDC. HIV. 2024. Fast Facts: HIV and Transgender People. Available from: https://www.cdc.gov/hiv/data-research/facts-stats/transgender-people.html. Cited 2024 Aug 15.
5. North Carolina HIV/STD/Hepatitis Surveillance Unit. 2022 North Carolina HIV Surveillance Report. N C Dep Health Hum Serv Div Public Health Commun Dis Branch. 2023; Available from: https://epi.dph.ncdhhs.gov/cd/stds/figures/2022-HIVSurveillanceReportSummary.pdf
6. HIV.gov. Ending the HIV Epidemic. Available from: https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview. Cited 2024 Aug 15.
7. CDC. Social Network Strategy for HIV Testing Recruitment. 2023. Available from: https://www.cdc.gov/hiv/effective-interventions/diagnose/social-network-strategy/index.html. Cited 2024 Aug 15.
8. Schumann C, Kahn D, Broaddus M, Dougherty J, Elderbrook M, Vergeront J, et al. Implementing a Standardized Social Networks Testing Strategy in a Low HIV Prevalence Jurisdiction. AIDS Behav. 2019;23(1):41–7.
9. Lightfoot MA, Campbell CK, Moss N, Treves-Kagan S, Agnew E, Kang Dufour MS, et al. Using a Social Network Strategy to Distribute HIV Self-Test Kits to African American and Latino MSM. JAIDS J Acquir Immune Defic Syndr. 2018;79(1):38–45.

10. McGoy SL, Pettit AC, Morrison M, Alexander LR, Johnson P, Williams B, et al. Use of Social Network Strategy Among Young Black Men Who Have Sex With Men for HIV Testing, Linkage to Care, and Reengagement in Care, Tennessee, 2013–2016. Public Health Rep. 2018;133(2_suppl):43S-51S.
11. McCree DH, Millett G, Baytop C, Royal S, Ellen J, Halkitis PN, et al. Lessons learned from use of social network strategy in HIV testing programs targeting African American men who have sex with men. Am J Public Health. 2013;103(10):1851–6.
12. Centers for Disease Control and Prevention (CDC). Use of social networks to identify persons with undiagnosed HIV infection--seven U.S. cities, October 2003-September 2004. MMWR Morb Mortal Wkly Rep. 2005;54(24):601–5.
13. Partner Services | Diagnose | Effective Interventions | HIV/AIDS | CDC. 2023. Available from: https://www.cdc.gov/hiv/effective-interventions/diagnose/partner-services/index.html. Cited 2024 Aug 15.
14. Zamantakis A, Merle JL, Queiroz AA, Zapata JP, Deskins J, Pachicano AM, et al. Innovation and implementation determinants of HIV testing and linkage-to-care in the U.S.: a systematic review. Implement Sci Commun. 2024;5(1):111.
15. Jaramillo J, Harkness A. Supporting the helpers: what do peer deliverers of HIV interventions need to sustain their implementation efforts? Transl Behav Med. 2023;13(11):826–32.
16. Stojanovski K, Naja-Riese G, King EJ, Fuchs JD. A Systematic Review of the Social Network Strategy to Optimize HIV Testing in Key Populations to End the Epidemic in the United States. AIDS Behav. 2021;25(9):2680–98.
17. Curran GM, Bauer M, Mittman B, Pyne JM, Stetler C. Effectiveness-implementation Hybrid Designs: Combining Elements of Clinical Effectiveness and Implementation Research to Enhance Public Health Impact. Med Care. 2012;50(3):217–26.
18. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated Consolidated Framework for Implementation Research based on user feedback. Implement Sci. 2022;17(1):75.
19. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. Qual Quant. 2018;52(4):1893–907.
20. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. Int J Qual Methods. 2009;8(3):1–21.
21. Hennink MM, Kaiser BN, Weber MB. What Influences Saturation? Estimating Sample Sizes in Focus Group Research. Qual Health Res. 2019;29(10):1483–96.
22. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77–101.
23. CDC. Status Neutral HIV Prevention and Care | Prevent | Effective Interventions | HIV/AIDS | CDC. 2023. Available from: https://www.cdc.gov/hiv/effective-interventions/prevent/status-neutral-hiv-prevention-and-care/index.html. Cited 2024 Aug 15.
24. Baytop C, Royal S, Hubbard McCree D, Simmons R, Tregerman R, Robinson C, et al. Comparison of strategies to increase HIV testing among African-American gay, bisexual, and other men who have sex with men in Washington. DC AIDS Care. 2014;26(5):608–12.
25. Boyer CB, Hightow-Weidman L, Bethel J, Li SX, Henry-Reid L, Futterman D, et al. An Assessment of the Feasibility and Acceptability of a Friendship-Based Social Network Recruitment Strategy to Screen At-Risk African American and Hispanic/Latina Young Women for HIV Infection. JAMA Pediatr. 2013;167(3):289–96.
26. Boyer CB, Robles-Schrader GM, Li SX, Miller RL, Korelitz J, Price GN, et al. A Comparison of Network-based Strategies for Screening At-Risk Hispanic/Latino Adolescents and Young Adults for Undiagnosed Asymptomatic HIV Infection. J Adolesc Health Off Publ Soc Adolesc Med. 2014;55(6):765–73.
27. Wells N, Murphy D, Ellard J, Philpot SP, Prestage G, on behalf of the RISE Study Team. HIV Diagnosis as Both Biographical Disruption and Biographical Reinforcement: Experiences of HIV Diagnoses Among Recently Diagnosed People Living With HIV. Qual Health Res. 2023;33(3):165–75.
28. Genberg BL, Shangani S, Sabatino K, Rachlis B, Wachira J, Braitstein P, et al. Improving Engagement in the HIV Care Cascade: A Systematic Review of Interventions Involving People Living with HIV/AIDS as Peers. AIDS Behav. 2016;20(10):2452–63.
29. Harling G, Tsai AC. Using social networks to understand and overcome implementation barriers in the global HIV response. JAIDS J Acquir Immune Defic Syndr. 2019;82(Suppl 3):S244–52.
30. Aral S, Walker D. Identifying influential and susceptible members of social networks. Science. 2012;337(6092):337–41.
31. Rogers EM. Diffusion of preventive innovations. Addict Behav. 2002;27(6):989–93.
32. Tobin KE, Heidari O, Winiker A, Pollock S, Rothwell MD, Alexander K, et al. Peer Approaches to Improve HIV Care Cascade Outcomes: a Scoping Review Focused on Peer Behavioral Mechanisms. Curr HIV/AIDS Rep. 2022;19(4):251–64.
33. Powell BJ, McMillen JC, Proctor EK, Carpenter CR, Griffey RT, Bunger AC, et al. A Compilation of Strategies for Implementing Clinical Innovations in Health and Mental Health. Med Care Res Rev. 2012;69(2):123–57.

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