



# Telehealth for HIV Care Services in South Carolina: Utilization, Barriers, and Promotion Strategies During the COVID-19 Pandemic

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## Abstract

To ensure continuing HIV care services during the COVID-19 pandemic, telehealth has been recommended and implemented in numerous HIV-related facilities. This study aims to understand telehealth utilization for HIV care services in South Carolina (SC), identify barriers to telehealth during COVID-19, and investigate strategies to facilitate remote HIV care delivery. In-depth interviews with 11 management personnel from 8 HIV-related facilities in SC were analyzed using thematic analysis. Utilizations of telehealth were diverse in delivering medical and non-medical HIV care services. Barriers included technological challenges, digital literacy, client/provider experiences, low socio-economic status of client population, and reimbursement issues. Various strategies were mentioned for promoting telehealth utilization, from client empowerment, provider training to improved organizational readiness. For successful telehealth use during and after COVID-19, it is necessary to continue efforts to promote telehealth and remove barriers to telehealth by implementing inclusive multi-level strategies for non-technologically savvy or disadvantaged populations living with HIV.

**Keywords** HIV care services · Telehealth · COVID-19 · Qualitative study · South Carolina

## Introduction

The ongoing pandemic of the coronavirus disease (COVID-19) and public health prevention measures (e.g., shelter-in-residence, quarantine, travel restrictions) have impacted healthcare and other support services in the United States (US) particularly for chronic conditions including human immunodeficiency virus (HIV) [1–4]. HIV care interruptions and discontinuation due to the COVID-19 pandemic

impact both people living with HIV (PLWH) and people at risk of acquiring HIV [5, 6]. Fragmented or discontinued HIV care services including medical care (e.g., antiretroviral treatment [ART], HIV prevention and testing) and non-medical support services (e.g., transportation, food and housing services) can impact HIV transmission, progression and treatment outcomes like ART success and PLWH mortality [7, 8].

To ensure continuous HIV care during the pandemic, telehealth was recommended and implemented in diverse settings [1, 9–14]. Telehealth entails “the delivery and facilitation of health and health-related services including medical care, provider and patient education, health information services, and self-care via telecommunications and digital communication technologies” (15, p. 1). Telehealth creates virtual capacity, helps conserve scarce resources like personal protective equipment, enables the provision of safe and quality patient care, and allows providers to maintain social distancing to minimize virus spread [16]. Healthcare facilities deploy telehealth services for patient forward triage, follow-up visits and electronic visits (e-visits) [9, 10].

Prior to March 2020 (pre-COVID-19), telehealth uptake was low across the US [17–19]. COVID-19 mitigation factors such as social distancing and organizational closures

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forced healthcare organizations, AIDS service organizations (ASOs) and other health service providers to quickly adopt alternative modes of care delivery leading to an instant shift of significant proportions in HIV care services to telehealth. However, HIV service providers may experience challenges with this rapid shift of health systems to telehealth without allowing a pilot phase, staggered rollouts or “grace periods”. Understanding these unprecedented challenges is key to informing strategies for seamless and high-quality telehealth services for HIV care during COVID-19 and thereafter [20]. Extant literature has described experiences and successful transformations of HIV prevention and care services via telehealth for sexual and gender minority populations in Rhode Island [12], pre-exposure prophylaxis (PrEP) and HIV home testing in Brazil [21, 22] and also depicted barriers and challenges to telehealth in HIV care in New York [11]. However, there is limited knowledge on HIV care delivery through telehealth in the rural South.

South Carolina (SC), with its high HIV incidence and prevalence [23–25], faced high levels of HIV care service interruptions due to COVID-19 (partial interruption of 56% and 26% complete interruption of HIV clinics) [4]. There is a disproportionate burden of HIV among racial and ethnic minorities as well as people with lower education attainment and income levels in SC [26, 27]. PLWH in SC might face increased challenges in telehealth utilization since they may be less likely to have access to or use the internet [28–31]. Furthermore, as of 2019, ASOs in SC suffer from the absence of a commercial payer telehealth statute that regulates coverage or payment parity for telehealth services for SC [32], which impacts organizational adoption of telehealth [10, 17].

Most previous studies on telehealth focus on medical HIV prevention and treatment services [11, 12, 21, 22]. There is little known about non-medical HIV care services for PLWH including case management, housing, food, and transportation services during the pandemic. By expanding the focus of this study on non-medical HIV care services, our findings contribute to the literature by including a broader spectrum of HIV services and their challenges with telehealth since the onset of COVID-19. Moreover, knowledge from SC, a rural state with structural barriers to telehealth and a particularly high burden of HIV, is a scarce yet crucial factor for developing successful mechanisms that address HIV during the current COVID-19 pandemic.

Therefore, the objective of the current study is to gain an understanding of telehealth utilization for HIV care services (both medical and non-medical services) in SC, identify barriers to remote service provision and strategies to promote HIV care through telehealth during the COVID-19 pandemic based on qualitative data collected from HIV care service organizations. The data analysis was guided by the conceptual framework developed by Grol and Wensing [33]. This

framework includes 6 domains to organize barriers and facilitators of telehealth: innovation-specific factors, service provider-specific factors, client-related factors, social context factors, organizational context factors, and economic and political context factors [33]. These domains provide us with a blueprint for categorizing barriers to telehealth utilization and strategies for promoting telehealth at different levels of care. The framework is well suited for this study because of the multi-level structure represented in the domains. The combination of domains reflecting both stakeholder-related and context specific factors allow us to capture the complicated environment of the reactive telehealth implementation in HIV care during a pandemic such as COVID-19.

## Methods

This study used a qualitative study design to capture information based on recent changes in HIV service delivery experiences due to the COVID-19 pandemic. Qualitative methods have been utilized to broaden the information that might have been collected with quantitative methods due to the interviewees’ ability to respond in an open-end format. To allow for flexible scheduling and include interviewees from several HIV-related facilities, semi-structured in-depth interviews were conducted among management personnel of an academic medical center, local ASOs, and the SC state public health agency.

All interviews were conducted in SC, which has been consistently ranked among the top 10 in the United States (US) for the number of annual HIV/AIDS cases over the past several years (e.g., the 7th in 2017) [34]. SC also had the 8th highest incidence rate of HIV infection (14.3 per 100,000 population) in the nation [34]. Between 2008 and December 31, 2017 the number of SC residents living with HIV has increased by 30% [35], bringing the total PLWH population to 20,166 at the end of 2018 [36]. Additionally, as of March 20, 2021, the total number of coronavirus cases in SC has risen to 459,772 [37].

Considering management personnel have a broad knowledge of their organizations’ daily operation, we purposely reached out and recruited directors/administrative leaders of HIV-related facilities for the study. We contacted all 27 HIV-related facilities (e.g., Ryan White HIV/AIDS program funded academic medical centers and ASOs in SC, and the SC state public health agency) in SC via email and invited their leaders to participate in in-depth interviews. We got 12 positive responses from them. Of the 12 scheduled in-depth interviews, 10 interviews were conducted with 11 directors/administrative leaders from eight facilities (one interview was held with two interviewees; one interview was canceled due to personal health reason). While the overall sample size

is relatively small, the inclusion of management personnel from eight different facilities allowed us to capture a broad range of experiences with HIV-related care services while avoiding to influence HIV service delivery when the physicians were already overwhelmed with their work during the COVID-19 pandemic. All interviewees consented verbally to participate in the in-depth interviews during the recruitment. The study protocol was approved by the Institutional Review Board at University of South Carolina (Pro00100296).

All interviews were conducted virtually in July 2020 by a team of experienced interviewers. A semi-structured interview guide was developed to assess organizations' telehealth utilization and strategies in response to COVID-19, facilitators and barriers to telehealth, and coping strategies to facilitate telehealth for HIV care (see sample questions in Table 1). All interviews were guided by the same initial interview questions for each topic area followed by tailored follow-up questions by the interviewers based on the interviewee's responses. Interviews took place through a teleconferencing platform to accommodate social distancing requirements in the ongoing pandemic and took approximately 40–50 min per interview. With appropriate consent, interviews were digitally recorded.

All interview recordings were transcribed verbatim. To protect interviewees' identities, names of individuals and organizations as well as other identifying information were removed from the transcripts. The audio files were first transcribed by the online transcription and editing platform Otter. To ensure data quality and completeness, verbatim transcripts were reread and corrected if necessary. All transcripts were coded line-by-line in Nvivo 11.0, a qualitative data management and analysis software [38]. An initial codebook (see online Supplemental Table I.) with pre-developed structural coding categories and sub-categories was developed based on the research questions and topics covered in the interview guide by SQ, and subsequently expanded by adding new codes that emerged

during the coding process. VY and SQ coded the transcripts and discussed disagreements until resolved.

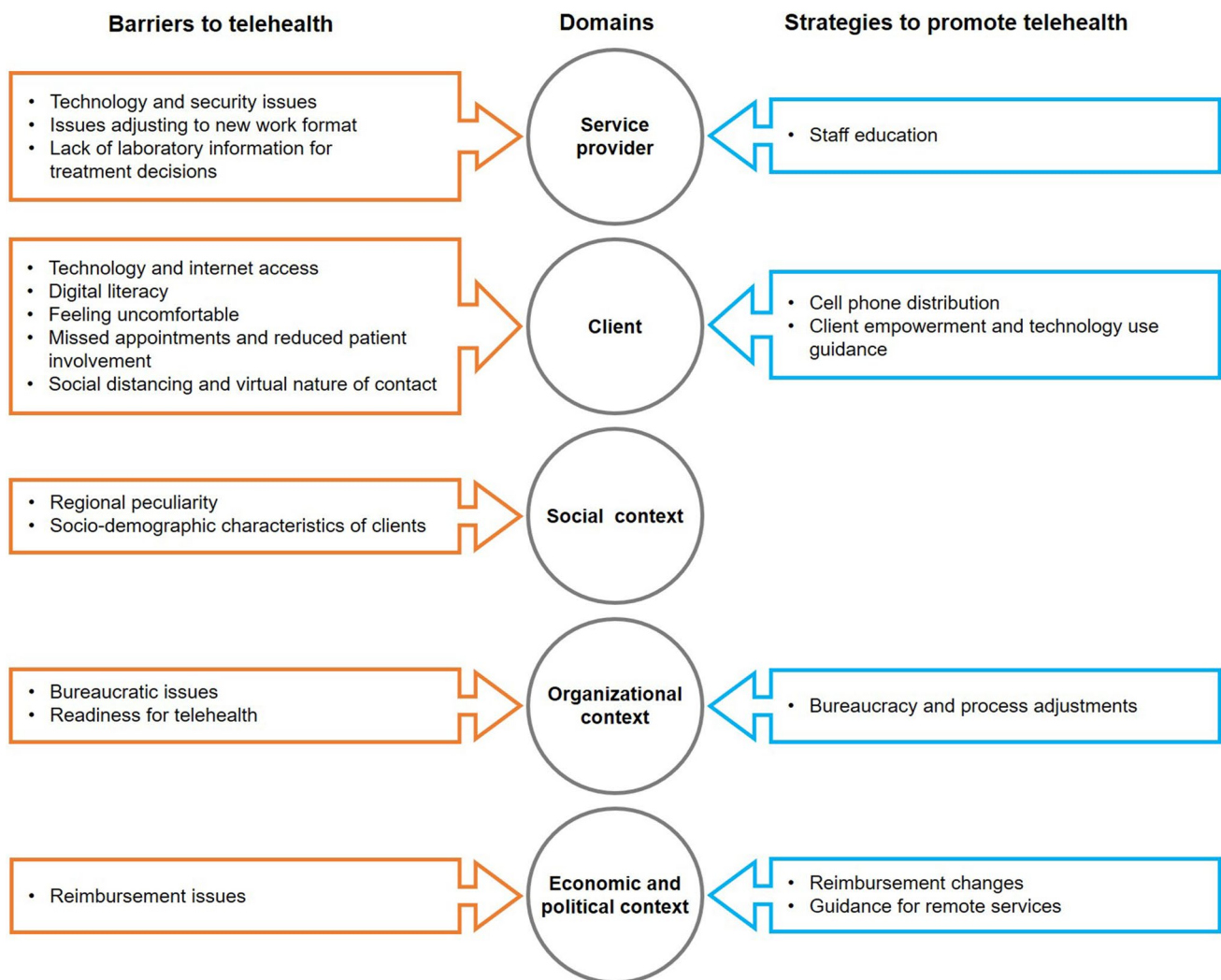
Data analysis followed a thematic analysis approach in which constructs within the main domains of interests were explored and synthesized [39]. We identified themes and subthemes by grouping and categorizing the codes. To map barriers to telehealth as well as strategies aiming to promote telehealth and address experienced barriers, Grol and Wensing's theoretical framework was applied [33]. The framework has been previously used to organize telehealth barriers [40] and is comprised of six domains conceptualizing barriers to and facilitators of telehealth including: (1) innovation-specific factors describing the telehealth format; (2) service provider-specific factors (e.g., adjustment to new work format, dealing with absence of laboratory information); (3) client-related factors (e.g., digital literacy, access to internet and technology); (4) social context (e.g., socioeconomic characteristics of clients); (5) organizational context (e.g., organizational readiness for telehealth); and (6) economic and political context (e.g., reimbursement issues) [33]. For this study we used domains [2] through [6] (See Fig. 1). The innovation domain [1] was excluded because the objective of this study was to assess all types of telehealth use instead of assessing the implementation of a specific telehealth product or software. The research team selected representative, verbatim quotes to illustrate key findings. All quotes presented in the results section of this manuscript are exemplary to showcase the essence of the reported findings and not the frequency that they were mentioned by interviewees. Data analysis and manuscript preparation were guided by the Standards for Reporting Qualitative Research (SRQR) guidelines [41].

## Results

The participants of our study came from 6 different ASOs (75%), an academic medical center (12.5%), and the state public health agency (12.5%). While the state public health

**Table 1** Sample questions from interview guide

Domains	Sample Questions
Background information	Please describe your organization in terms of scope of healthcare service including the HIV services Please describe your role in the organization
Impact of COVID-19 on HIV-related services	Were there any HIV services (e.g., surgeries, counseling) that you had to stop or were interrupted by the pandemic? What were they? What were the reasons for this interruption?
Virtual HIV care	Did you use virtual platforms for delivering HIV care? How did you implement these services online? What were the barriers and facilitators? How did physicians/patients respond to this? How did you manage these services?



**Fig. 1** Summary of barriers to telehealth and strategies to promote telehealth for HIV services

agency serves PLWH or at risk of HIV throughout the state of SC, the participating ASOs and academic medical center serve people living in 17 out of 46 counties in SC. About 42% of PLWH with a reported HIV diagnosis live within these counties. Most interviewee' facilities had 10 or more employees (75%). HIV testing (87.5%), prevention and treatment (75% each), and counseling, behavioral health and/or support group services (62.5%) were the most common services provided by these facilities. Other services provided by interviewees' facilities included outreach services and case management (50% each), transportation, food, clothing, and housing services (25% each), health insurance assistance, advocacy, funding provision for HIV care through other entities and education/certification of HIV testing staff (12.5% each). See Table 2 for more details.

## Utilization of Telehealth in HIV Care

### Technology Used for Telehealth

Telehealth services were performed using telephone calls, video-enabled virtual meeting software or applications (apps) and specific telehealth platforms and apps. To exchange signatures and forms or get client consent, either software or pictures of filled out forms were utilized.

### Services Provided Through Telehealth

Telehealth was used to provide a wide array of medical and supportive HIV services. Non-medical services including case management, support groups, housing, food and transportation services were reported to be provided via phone or video calls and in conjunction with the online or app-based

**Table 2** Demographic characteristics of interviewee organizations (N = 8)

Characteristics	n (%)
<i>Organization type</i>	
AIDS Service organizations	6 (75)
Academic medical center	1 (12.5)
State public health agency	1 (12.5)
<i>Size (members and employees)</i>	
> 10	6 (75)
Not reported	2 (25)
<i>Number of patients/clients served</i>	
< 1,000	2 (25)
≥ 1,000	3 (37.5)
Not reported	3 (37.5)
<i>Services provided by organizations<sup>a</sup></i>	
HIV prevention	6 (75)
HIV testing	7 (87.5)
HIV treatment	6 (75)
Case management	4 (50)
Outreach services	4 (50)
Counseling, behavioral health, support groups	5 (62.5)
Transportation	2 (25)
Health insurance assistance	1 (12.5)
Food and clothing services	2 (25)
Housing services	2 (25)
Advocacy	1 (12.5)
Education/Certification of HIV testing staff	1 (12.5)
Provide funding for HIV care by other entities	1 (12.5)

AIDS acquired immuno-deficiency syndrome, *HIV* human immuno-deficiency virus

<sup>a</sup>Reported by interviewees; multiple responses possible

exchange of signatures. Interviewees from a facility providing case management and support groups described that they “have a DocuSign document that goes out for them for releases to join and enter, and then they get invited into a group,” (Interview #5). The same interviewees shared that they use a Health Insurance Portability and Accountability Act (HIPAA) compliant app called “Click” to conduct their virtual groups (Interview #5). An interviewee from a facility providing non-medical HIV services highlighted the need for these signature services when they shared that, “Tele case management is not something we’ve done a whole lot of,” elaborating further they said, “But, you know, the hard part is, it’s very form heavy. So, you’ve got to get all those forms on, you have to keep them up to date,” (Interview #5).

Interviewees reported medication refills and delivery to clients, and assessments of medication adherence by telephone. One interviewee described, “we deliver on mail meds so often. ... We have a book that we track all the meds we

mail out and we deliver. So, we noticed that they haven’t gotten them, well, we’ll call them,” (Interview #6).

New client intake, follow-up, and routine HIV care visits were both performed through telephonic or video-based calls. Other applications included telephone calls for general administrative purposes including to discuss telehealth options and pending paperwork as well as wellness check-ins to assess patients’ needs and potential health issues. Counseling and behavioral health services were also offered through video calls and video-enabled virtual meeting software.

For healthcare providers, virtual formats were used to educate and certify new hires for providing HIV testing services. One interviewee said, “some of the requests from our grantees about increasing options from our division for their staff, new staff, or those who need refreshers to get, you know, virtual learning instead of just mandating they have to come to Columbia for an in-person training. So COVID-19’s positive impact has been that we have sped up the process to develop courses that had previously been mandatory to attend for a day in Columbia and put them into online format,” (Interview #8).

### Telehealth Frequency

Interviewees mentioned the rapidly increasing amount of telehealth encounters in comparison to pre-COVID-19 service provision. One interviewee explained, “We maybe did one telehealth visit a year, maybe two in the last year [2019], but we’ve got five or six going on every day now,” (Interview #5).

However, the proportion of telehealth visits for client contacts varied over the course of the pandemic and across organizations. One interviewee reported a split between employees, where some staff provided services exclusively via telehealth. Several interviewees described equally shared contacts through telehealth and in-person. Another interviewee reported a total shift towards telehealth services from March to June 2020.

### Decision-Making on Care Type

Organizations used different strategies to decide on which clients were scheduled for telehealth encounters. Some organizations accommodated the clients’ preferences, when possible, whereas in other organizations, providers selected the type of visit based on their clients’ health status, risk of infection, medication or treatment stability. One interviewee said, “we only saw patients in office that that were either new, or that I felt were not stable,” (Interview #4). Another interviewee described that they would like to keep patients with high risk of COVID-19 at home considering

the infection prevention, “did definitely more telephonic with the high risk, but the majority of our HIV patients came in and were seen because it’s the way he wanted it, our doctor,” (Interview #10).

## Barriers to Telehealth in HIV Care

### Service Provider-Related Barriers

**Technology and Security Issues** The lack of necessary technological equipment and cyber security were reported as barriers to telehealth for providers. One interviewee said that low resource organizations, “really found it hard to go on in cyberspace. They aren’t able to put in network solid, safe network, and internet networks to be able to simply provide gathering spaces,” (Interview #1). Furthermore, difficulties working from home for both telephonic and video-based telehealth visits were described by an interviewee who said, “When I call from home, I go through a health care dialer, which still comes up with our main number, but they can’t call me back on that. So, when we’re home, unless they call in here and the secretary calls me and says, ‘call them back right now,’ they can’t get ahold of me because I’m not, I’m not going to give up my cell phone number. Um, so that’s been a big issue at home with telehealth is just getting them on the phone,” (Interview #4).

Interviewees further described issues like working with private electronic devices due to HIPAA: “I have a laptop that’s a work laptop that has all my stuff on it about my patients. We couldn’t use Facebook, and we couldn’t use Zoom because of the HIPAA stuff, you know, when you’re doing a patient visit. So, um, for those patients that we attempted telehealth, and couldn’t we just had to do a telephone visit” (Interview #7).

**New Work Format** Providers were unfamiliar or uncomfortable with remote service provision and had issues adapting to telehealth, particularly in the clinical setting and for case management. An interviewee from a facility providing case management highlighted, “I think a lot of us aren’t used to working from home in the clinic setting. So, I think that’s been the most frustrating for us is adjusting into working from home and getting clients used to doing telehealth. You know, tele case management is not something we’ve done a whole lot of. ...But, you know, the hard part is it’s very form heavy. So you’ve got to get all those forms on, you have to keep them up to date,” (Interview #5).

**Lack of Laboratory Information for Treatment Decisions** Regarding clinical decision-making, interviewees reported the inability to review and monitor up-to-date laboratory values as another barrier to HIV-related telehealth care for healthcare providers. As one interviewee put it,

“I feel like with the telephone visit, because, you know, because our providers kind of like to keep a close eye on lab work, and so I think that is one of the things that I think got put off, not so much medication, but you know, labs got put off a little bit longer,” (Interview #9).

### Client-Related Barriers

**Technology and Internet Access** While interviewees mentioned that many clients have access to basic phones, smartphones or other devices allowing to use applications to perform video- or app-based telehealth visits were not available to all clients. Accordingly, interviewees described technology-related client-level barriers to remote HIV care services due to missing necessary access to suitable electronic devices in their interviews (e.g., “a lot of them don’t have smartphones,” [Interview #6]) and internet (e.g., “Patients who are in some of the rural counties that I take care of, don’t have WiFi, [Interview #7]). One interviewee reported, “You know, there’s not a lot of access to technology in this area. There’s a high rate of poverty. So that’s been a huge issue, and then just even getting them to buy into that platform, whereas, you know, obviously everyone would prefer to be seen face to face,” (Interview #5).

**Digital Literacy** Besides the access to and suitability of technology, interviewees reported clients’ digital literacy to be a barrier to telehealth beyond telephonic visits. Interviewees described their clients’ issues to navigate installation or setup processes of applications for telehealth visits due to low digital literacy, reading ability and an unfamiliarity with telehealth technology triggering resistance and fear. In discussing this barrier, one interviewee explained that “a lot of our patients don’t read. They don’t understand that—it overwhelms them. You know, I took multiple calls last week about it when I worked the screening desk. They would say no, no, no please don’t make me do that. Please don’t let, that scares me,” (Interview #10). Another interviewee said that their clients “don’t have the education level to understand how to download the apps,” (Interview #6).

**Feeling Uncomfortable** Clients’ hesitation towards telehealth visits due to the less personal nature of telehealth visits was mentioned as a barrier by 5 out of 11 interviewees, one reported that telehealth options “worked for some people, but a lot of people just fell off. They, they weren’t comfortable with that, and so, they just stopped receiving services or stopped applying for services,” (Interview #2). Another interviewee mentioned “there’s still a good bit of hesitation, and our no-show rate is still pretty high,” (Interview #9).

Telehealth hesitancy was not just because of technique issues. According to one interviewee, some clients were

“laying in the dark, like sleeping in their beds rather than like being interactive on it. So, it was not so much the, the actual like delay of like WiFi or anything to that effect. The [issue] was more that the patients weren’t, weren’t on top of it as much as if they were involved in in-person,” (Interview #6). Interviewees reported high rates of missed telehealth appointments (up to 50% estimated by one interviewee) and issues reaching patients for their appointments: “The most frustrating thing for me” exclaimed one interviewee “is when I call, and they just don’t answer their phone, um, but yet it’s documented that they’ve been talked to, and they’ve got a text and they’ve got an email saying, you know, your telehealth visit is at, you know, 3 pm on Tuesday,” (Interview #4).

**Social Distancing and Virtual Nature of Contact** Furthermore, social distancing of clients trying to prevent COVID-19 infection and the virtual contact with their providers was reported to hamper support group and behavioral health services. One interviewee elaborated, “it just is not going to be the same to carry out a group of behavioral intervention through some sort of virtual means. The whole point of that is really support with folks being in close contact again,” (Interview #8). Another interviewee reported that some socially distanced clients “haven’t seen a lot of people, so when they pop in [to the virtual support group], and they see 10 people on screen, they’re excited to talk about everything. Keeping them on topic, roping them in the first couple of times was little harder, but it’s getting a lot better,” (Interview #5).

Other HIV care services were also affected by limited information exchange due to the virtual format. As described in interview #6 the connection, “just over the phone, is not as personable. The case managers weren’t there when they were doing the telehealth visits. So what I’ve noticed, I’ve been in the agency for five and a half years, and what I’ve noticed with the patients: they’ll tell some people some things, and they’ll tell somebody else something else, and they really know their case managers, and the case managers really know them. So with them not seeing their case managers in person, I think it definitely, like, we weren’t getting as much information out of a lot of our patients.”

### Social Context Barriers

**Regional Peculiarity** Interviewees from an organization serving HIV clients in multiple states reported that they had noticed higher levels of client resistance and hesitancy towards telehealth in South Carolina compared to other locations throughout the US. One interviewee described: “I think looking like site-wise, since we have so many different sites, I think South Carolina has really had the hardest time patient-wise adjusting to telehealth,” (Interview #5).

**Socio-demographic Characteristics of Clients** Unique socio-demographic characteristics of clients served by interviewees’ HIV care organizations were mentioned as an access barrier to technology and WiFi needed for telehealth: “We’ve had a lot of resistance from the patients for doing that,” stated interviewee #5. “You know, there’s not a lot of access to technology in this area. There’s a high rate of poverty. So that’s been a huge issue” (Interview #5). Another interviewee shared, “we’re a federally qualified health center, we work with a lot of patients that are underserved, uninsured, poverty stricken. So, a lot of them don’t have smartphones,” (Interview #6).

### Organizational Context Barriers

**Bureaucratic Issues** Interviewees reported that bureaucratic requirements and difficulty in getting client information and signatures for essential forms due to the lack of in-person contact posed a challenge to telehealth. As one interviewee described, “we weren’t getting the paperwork done as sufficiently and you know, in a timely manner because we had to mail it to them. So, in that sense, I feel like it affected their HIV care, but as far as like getting their meds and getting like getting an appointment, that wasn’t necessarily affected,” (Interview #6).

**Organizational Readiness** Interviewees highlighted the importance of new or existing software and procedures to successfully enroll clients in telehealth platforms. However, the organizational unfamiliarity with such software and procedures impeded the swift shift to remote HIV service delivery. One interviewee explained, “But our agency wasn’t set up for telehealth. We didn’t—we had just, we had just switched to electronic medical records back in December. So it was still really new to us: the new electronic system we’re using. So we were not set up for telehealth,” (Interview #6).

Another interviewee described their facility’s failed effort to buy and set-up new telehealth software leading to a financial loss and hesitation towards telehealth, “a huge disappointment was the investment in the telehealth program that we trained all the providers on the staff on, and it—the interface never worked. So it was, just like I said, just a big, huge wash, but a whole lot of time went into it a whole lot of preparation, this that the other and there seems to be a huge stain for everybody above me” (Interview #10).

### Economic and Political Context Barrier: Reimbursement Issues

Some interviewees reported issues with lower rates of reimbursement for telephonic compared to in-person visits as a financial factor to impede telehealth-based HIV services

in SC. In discussing the issue of reimbursement, one interviewee stated, “I think it has always been available, but it’s billed at a lower rate,” (Interview #4) and another interviewee quantified the reimbursement rates saying, “the telephonic visit was—I don’t know, an eighteenth of what an office visit was,” (Interview #10).

## Strategies to Facilitate Telehealth

### Service Provider-Related Strategies: Staff Education

Staff education and training sessions were reported by interviewees to facilitate telehealth. As reported by one interviewee, “All of the providers were brought together and trained and talk to about the telephonic and the telehealth. Our ID people were present. We have a clinical ID and then just regular ID people. They were in the building at all. ... We met with all of the staff, they had to learn their role as far as the people, the PHA or the people at the front (we call them the pars that check you in), how they would manage that over the telephone, then you would instruct the patient that the next call would be from the nurse. I mean, we had to educate everybody on their roles for both of those platforms [telephonic and telehealth],” (Interview #10). Providers and staff also received training on newly developed procedures, forms, templates, and documentation to ensure smooth telehealth visits. Another interviewee described that telehealth procedures are “built into our EMR, but we had never turned it on because we’ve never used it. Once you turn it on, then you have to sort of create, you know, some templates, and you have to kind of create these pathways to make documentation as streamlined as possible. And so we’ve kind of done that. And we’ve done several training visits, if you will. So we’re, we’re more or less ready to go live with that,” (Interview #4).

### Client-Related Strategies

#### Cell Phone Distribution

Two interviewees mentioned utilizing phone distribution programs that issue both WiFi-enabled smartphones and minutes to clients qualifying for the program. One interviewee said: “So we’re trying to address that through this positive links [a cell phone distribution] program. So we’re trying to make sure that anybody that really needs a phone gets one. Now, that’s predicated on several factors that I’m not in charge of and don’t want to be in charge of. But, so we are doing better with giving patients the ability to reach out, and these are smartphones, so they can also get on the portal and look at their labs and things like that” (Interview #4).

### Client Empowerment and Technology Use Guidance

Interviewees reported client empowerment strategies to facilitate telehealth visits including personal check-in calls from the attending physician, educational videos, or phone-based guidance to download, set-up, access and navigate through telehealth platforms. One interviewee explained, “when I do like the nurse intake part of that telehealth appointment, I also go through and I try to call them at least an hour before their scheduled time so that we can troubleshoot as needed.” They further mentioned, “in between our EMR team and our IT team, they’ve developed little videos, little things on our website that walk a patient right through step by step on what to do and how to do it,” (Interview #5). Another interviewee reported that, “the provider themselves, would call the patient. And so I think the patient was like, ‘Wow’, you know, here’s, here’s my doctor calling me to check on my welfare,’ you know, and so they were like really impressed and taken aback and, and would share and talk, and so our providers could actually just go ahead and do their visit when they call to check on them,” (Interview #9).

### Organizational Context Strategies

#### Bureaucracy and Process Adjustments

Interviewees reported a newly introduced requirement to set-up new patients for telehealth as part of their client in-take procedure. One interviewee said, “Me, personally, I have requested that every single new clinic patient that comes in—we get them hooked up with telehealth at that first appointment,” (Interview #5).

New processes and pathways were implemented to streamline documentation fulfilling telehealth reimbursement requirements and to handle paperwork. As one interviewee described, “So you’ve got to get all those forms on, you have to keep them up to date, and mailing forms out, has happened more in the last four months than I think has happened to my last 20 years. I’ll get a lot of case management is done face to face. So the wonderful thing about [the facility] is we have options for telehealth, we have options for—we have a click option for texting and sending pictures and videos back and forth with patients,” (Interview #5).

Another interviewee described that their facility “came up with a system of us being able to provide telephone visits, and they also had worked out how we’re going to get reimbursement for that. And so, so they gave us details on what did our note have to entail? What did—what are the specifics of it to make it a billable visit?” (Interview #9).



## Economic and Political Context Strategies

### Reimbursement Changes

Interviewees mentioned a governmental reimbursement mandate guaranteeing temporary identical reimbursement of virtual visits and in-person visits to promote telehealth services and address existing reimbursement issues. One interviewee said, “I think Blue Cross Blue Shield came out, and, or the government sort of mandated that until—I think now it goes at least to August 30 [2020]—that you will get paid your regular office visit,” (Interview #4).

### Guidance for Remote Services

Furthermore, telehealth guidance from a governmental healthcare agency to facilitate HIV home testing was mentioned as a facilitator of telehealth by interviewees. One interviewee shared that the “CDC has an entire website, set up to talk about HIV home testing and guidance on that. So some of them are looking at ways in which a client ID is assigned, the client gets sent the test kit, a telehealth experience occurs in which the agency can walk them through self-testing at home, and can offer them resources if the, if the rapid test comes back positive to get them on into services,” (Interview #8). Interviewees expressed their belief that telehealth will be continued during and after the COVID-19 pandemic, especially for client populations living with HIV and expressing hesitation to return to in-person visits. One interviewee said, “Telehealth is not going to go away even with COVID. So, we need to overcome those obstacles that we’re seeing,” (Interview #5). Some interviewees see telehealth both as a tool for routine use and in response to future pandemics or crises like hurricanes, while others emphasize the need to return to in-person contacts for some HIV-related services or suggest evaluating the effect of telehealth: “probably it would be interesting to kind of do a study to see if it’s—what kind of an effect it had,” shared one interviewee, (Interview #9).

Two interviewees questioned whether it was feasible for HIV testing services and PrEP to be provided entirely through telehealth and suggested a hybrid combination of remote and in-person delivery. As one interviewee explained, “Again, we don’t think the home testing methodology and that whole system is the best way to go. I don’t know if that’s going to go away just when we get a vaccine or when we get beyond the most difficult times of COVID-19. That [home testing] may be a creative way to still reach some of the population normally wouldn’t come in for face-to-face HIV testing,” (Interview #8).

Also, for new HIV testing staff training, an interviewee stresses the need of in-person coaching to ensure high-quality HIV testing delivery, saying that “when you get down to

a skills-based training, like actually delivering HIV testing itself, you can’t, we don’t believe we should be doing that through purely virtual. We need it—we need to see them face-to-face, and we need to be able to coach them face-to-face in-person,” (Interview #8).

## Discussion

Our findings described a diverse utilization of telehealth for delivering medical and non-medical HIV care services to clients living with HIV by South Carolina’s ASOs and academic health centers. Despite the broad and swift implementation of telehealth, incorporating remotely delivered HIV care services in SC has not been without its problems.

The technological barriers to telehealth for service providers and clients identified in the current study are similar to previously documented barriers to telehealth regarding technology features of telehealth in terms of feasibility (e.g., need to have a smartphone), concerns about privacy and cyber security [10, 11, 17, 42, 43]. Providers and clients both faced barriers in relation to visit experience (e.g., people prefer in-person contact, ease of use, simple procedures) which have been reported previously [11, 13, 18, 20]. While our results conflict with the mostly positive telehealth experiences reported by PLWH and their providers in Texas [1], Dandachi et al. also indicated associations between PLWH’s socio-economic status, technological and structural factors and their openness towards telehealth HIV care visits [44]. Hence, technological and individual barriers faced by clients might be accelerated by SC’s disproportionate burden of HIV among racial and ethnic minorities and people living in rural areas, or areas with low education and income levels [26, 27], which may explain the low reported digital literacy among clients living with HIV and the particularly high prevalence of hesitation to utilize telehealth among clients in SC.

Our study is the first effort to report the use, suitability, and recommendations for non-medical HIV care services such as case management, transportation, housing and food services during the COVID-19 pandemic. Non-medical support services are crucial for the holistic care of PLWH, especially for economically disadvantaged PLWH in times of a pandemic with potentially drastic economic challenges [3, 14].

Many of the barriers to telehealth reported here affect both medical and non-medical HIV care services, however there were distinct differences. Interviewees from organizations providing non-medical HIV care services highlighted the particularly high volume of paperwork and strict signature requirements for PLWH to receive financial assistance for housing, food and transportation as a significant

challenge. These bureaucratic issues were reported to disrupt previously utilized services when shifted to telehealth and restrict clients from accessing new services focusing on financial assistance for transport, housing, food and other challenges during the pandemic. Difficulties to fulfill bureaucratic requirements for non-medical services through telehealth might be further accelerated by stipulations inherent to these non-medical HIV services (e.g., eligibility criteria including income thresholds). This leads to a paradox as stipulations like income thresholds are required for non-medical HIV services, yet also pose a barrier to access technology and telehealth hampering their ability to provide signatures virtually. There is a high chance that people who are eligible for non-medical services due to low income are not able to provide signatures virtually since they are not able to afford WiFi or smartphones. Therefore, social context barriers related to socio-economic disadvantages of clients qualifying for non-medical support services might further hamper virtual service delivery.

Current strategies and efforts reported by interviewees from ASOs and academic medical centers partly addressed the barriers to telehealth they experienced during COVID-19. Strategies promoting telehealth aimed to overcome service provider, client and organizational context-related barriers through provider training, client empowerment, technological guidance, cell phone distribution, simplifying procedures and organizational process adjustments. However, reported strategies to empower clients and provide cell phones to eligible clients have not yet sufficiently addressed the clients' socio-economic vulnerability. While social context barriers to telehealth were previously established in the literature [31, 46, 47] and echoed by our results, no direct strategies to address these socio-economic disadvantages were reported in our study. Still, it is crucial to address social determinants of health to mitigate existing HIV-related disparities during and beyond the pandemic [31].

Reported policy and reimbursement issues (e.g., reduced reimbursement rates for telehealth visits) were consistent with pre-pandemic literature [10, 17], but were resolved during the pandemic through several temporary policy changes. Despite the absence of a commercial payer telehealth statute in SC pre-pandemic [32], policy changes easing up telehealth software requirements (i.e., ability to use non-HIPAA compliant software) [48, 49], documentation requirements [50], and establishing reimbursement assurance by several funding agencies [13, 49, 51], enabled ASOs and academic medical centers in SC to provide a large proportion of HIV care services virtually throughout the pandemic.

## Limitations

The current study is subjective to several limitations. First, we used thematic analysis to explore and synthesize interview data allowing data to be coded in multiple (sub-) categories by two coders. Inter-rater reliability scores were not formally assessed, but both coders discussed and resolved disagreements to obtain reliable coding.

Second, our small sample size comprised of 11 interviewees from 8 HIV-related facilities (i.e., 6 ASOs, one academic medical center, and one public health agency in SC) could limit the generalizability of our results and warrants further research to obtain a representative understanding of telehealth services and barriers in HIV care. However, the diversity of HIV-related services provided by the participating interviewees' organizations can be a strength due to the variety of information received by diverse service providing organizations and their respective barriers to telehealth.

Third, telehealth comprises a variety of different technologies and visit types including real-time visits with HIV service providers through telephone or video-based software and app-based asynchronous contact with providers, among others. Our study included all types of telehealth reported by interviewees and did not specifically probe to clarify the specific type of telehealth utilized for different telehealth formats. Therefore, some barriers to and strategies for promoting telehealth might only be applicable for a subset of telehealth options. While the inclusion of all types of telehealth allowed us to understand the big picture of telehealth utilizations, barriers and promotion strategies, future research might benefit from more distinct differentiation between technologies and formats of telehealth used.

Finally, experiences with and barriers to telehealth have only been assessed through interview responses from management personnel. Provider and client-side barriers need to be interpreted cautiously, as they were not directly assessed through client and provider interviews and may be perceived differently by the clients and providers themselves. Future research should verify and supplement our study findings with qualitative and quantitative research among HIV care providers and PLWH.

## Implications and Future Studies

Our results indicate telehealth's potential to be pursued as a sustainable HIV care provision tool during and post COVID-19. However, some skepticism has been voiced by our interviewees regarding the need for in-person contact and the exclusivity of telehealth visits, highlighting the need to adjust and evaluate current telehealth practices and resolve barriers to telehealth before it can reach its potential.

Technology-related challenges are a central barrier to telehealth as it affects the client-, service provider-, and organizational context domains. A holistic, multi-level approach to address and diminish technological barriers is needed to promote telehealth. Individual-level strategies should focus on client and provider empowerment and training to increase digital literacy enabling stress-free telehealth encounters [1, 13]. Organizational structures and processes need to adapt to the increased volume of telehealth visits. Economic and policy-related context barriers impairing telehealth (i.e., access to internet and technology, absence of long-term commercial payer telehealth laws, etc.) need to be resolved to enable telehealth visits for all South Carolinians. While focusing on barrier reduction, it is crucial to pay close attention to existing health disparities and ensure inclusive strategies for non-technologically savvy or disadvantaged populations living with HIV and feed into broader initiatives addressing social determinants of health. Despite not being reported by our interviewees, large scale initiatives to expand broadband access to rural locations in SC and the Southern United States (e.g., South Carolina Broadband Infrastructure Program) are worth mentioning here. Endeavors to provide broadband internet to remote areas have the potential to address the telehealth barrier caused by limited or absent access to broadband internet.

Patient-reported, and process-related health outcomes of telehealth visits need to be systematically evaluated in future research [1]. Understanding clients' needs for successful telehealth and factors contributing to telehealth hesitancy is essential to improve their willingness to use virtual HIV care services and to enhance telehealth utilization. While existing instruments are available to evaluate telehealth encounters [13, 53], it might be beneficial to incorporate population- and location specific assessment elements to capture challenges and outcomes specific to SC and HIV.

Although ASOs and academic medical centers use different strategies to decide on the type of visit (i.e., patient- or provider-driven selection of care type), transparent and evidence-based criteria guiding the selection of telehealth versus in-person visits are needed [1]. To establish such robust criteria, future research is needed to identify factors facilitating successful telehealth utilization.

## Conclusion

Our study revealed diverse telehealth service utilization by 8 HIV-related facilities (i.e., six of South Carolina's ASOs, an academic medical center and the state public health agency) to deliver both medical and non-medical HIV care services to their clients. By expanding the focus of this study beyond medical HIV care services, our findings contribute to the literature by including new findings

highlighting non-medical HIV services and their challenges with telehealth since the onset of COVID-19. Moreover, we identified barriers of telehealth related to service providers, clients, the social context, organizational context, and economic and political context. Strategies to facilitate telehealth in HIV care were mapped alongside the same domains of telehealth challenges highlighting the gaps and needs for further interventions. In summary, our findings underscore the need to evaluate existing telehealth services, establish criteria informing the selection of visit type and remove barriers to telehealth by considering health disparities and inclusive strategies for disadvantaged populations living with HIV.

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## Declarations

**Conflict of interest** The authors have no relevant financial or non-financial interests to disclose.

**Ethical Approval** The study protocol was approved by the Institutional Review Board at University of South Carolina (Pro00100296). Data analysis and manuscript preparation were guided by the Standards for Reporting Qualitative Research (SRQR) guidelines.

**Informed Consent** All interviewees consented verbally to participate in in-depth interviews.

**Data, Materials and/or Code Availability** Due to the qualitative nature of this research, participants of this study did not agree for their data to be shared publicly, therefore supporting data is not available.

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