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Key Stakeholder Perceptions of a Mobile HIV Care Model to Re-engage and Retain Out-of-care People Living with HIV in Atlanta, Georgia

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By

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2014

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Abstract

Key Stakeholder Perceptions of a Mobile HIV Care Model to Re-engage and Retain Out-of-care People Living with HIV in Atlanta, Georgia

By Michelle Henkhaus

Background: To reach national targets, novel strategies to re-engage and retain people living with HIV (PLWH) who are out of care are greatly needed. While mobile clinics have been used effectively for HIV testing and linkage, their use in providing HIV care is limited in the published literature. To guide the development of a mobile HIV clinic (MHC) model as a strategy to re-engage and retain PLWH who are out of care, we aimed to first explore key stakeholder perceptions and preferences for MHC implementation.

Methods: From June 2019-December 2019, as part of a larger mixed-methods study, 36 in-depth interviews were conducted with HIV clinic providers, staff, legal authorities, administrators, and Community Advisory Board members, AIDS service organizations, organizations implementing mobile health care, and city officials in Atlanta. Thematic analysis was used to examine perceived advantages, barriers, and facilitators of successful MHC implementation.

Results: Many supported use of MHCs if a few critical barriers were addressed (i.e. potential breach of confidentiality with resulting stigma, fractured continuity of care, safety concerns, staffing challenges, and community acceptance), and noted advantages (i.e. convenience, patient-centered care, potential to improve provider/staff understanding of patients' environments and display their commitment, and greater community reach). Participants provided suggestions (i.e. appropriate exterior design, MHC location and timing, and co-delivery of non-HIV services) that would facilitate MHC implementation and address key concerns.

Conclusions: MHCs have potential to be acceptable, effective means of re-engaging and retaining PLWH who are out of care. By identifying barriers and strategies to overcome them, this study informs the design of future MHCs and enables further research to test their effectiveness in improving re-engagement and retention among PLWH who are out of care.

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Chapter One: Introduction

The 16 states and District of Columbia that make up the South bear the greatest burden of HIV and related deaths out of any region in the U.S.[1] This region accounts for 52% of new HIV diagnoses while it is home to just 38% of the U.S. population.[1] Georgia in particular had 55,513 adults and adolescents diagnosed with HIV in 2017, 51% of whom were retained in care.[2] The Atlanta metropolitan area had over 40,000 people living with HIV (PLWH) at the end of 2017 and has the second highest rate of HIV diagnoses of all metropolitan areas in the U.S.[3, 4]

Retention in HIV care is an important precursor to viral suppression at an individual and population level and is one of the most important strategies for ending transmission of HIV in the U.S.[5] Viral suppression in PLWH reduces the morbidity and mortality of the infection, allowing patients to live longer, healthier lives.[5, 6] However, improving retention in care is difficult because patients face many different barriers to care at the individual-level (i.e. insurance status, lack of transportation, financial constraints, housing insecurity, mental health or substance abuse comorbidities), interpersonal-level (i.e. lack of social support), and community-level (i.e. presence of stigma, accessibility of healthcare services, social norms, poverty).[7] Nationally, common interventions to improve retention in care include social support services, case management,[8] co-location of services, appointment accompaniment,[9] additional services such as child care or housing services, appointment reminders, patient navigators,[10] peer support,[11] media such as brochures in the waiting rooms,[12] outreach, and transportation support.[8, 9, 13-16] Many of these interventions have shown promising results, however, the continued shortcomings in reaching retention targets necessitate research into new re-engagement and retention strategies specific to the needs of patients who have fallen out of care.[17, 18] Most interventions for retention in care are targeted at individual-level behavior and in medical settings; strategies targeting structural or system barriers could be improved and interventions utilizing community-based

organizations could be better assessed.[9] In addition, new strategies outside of clinic-based HIV care should be considered to meet the needs of those that have fallen out of traditional models of care, as well as address challenges of overburdened health systems, lack of patient-centered care, and resource limitations.[17]

In the South, medical mistrust,[19] pervasive HIV stigma, and stigma around sexual orientation, substance abuse and mental disorders,[20] poverty, and sex work, may be deterring the highest risk groups from seeking and remaining in HIV care.[1] The Georgia Department of Public health aims to increase the number of PLWH retained in care to 90% and improve retention in care for targeted populations by 50% by 2021.[21] One strategy to achieve those goals, outlined in the Georgia Integrated HIV Prevention & Care Plan 2017-2021, is to establish mobile units to facilitate access to care for African-American men who have sex with men (MSM) and women, transgender females, and Hispanics.[21]

Mobile health clinics are models of health care delivery, typically offered on a van, bus, or other vehicle, that can move to different locations to provide medical services directly in a community rather than in a traditional, clinic-based setting. Mobile health clinics have been used for delivering a variety of health services and have been successful in improving access to health care, especially among vulnerable populations.[22] Presently in the U.S., mobile health clinics are being used to provide medical services such as primary care, asthma care and control in children, maternal and infant health services, prevention screenings, dental services, and some specialty care such as mammography and ophthalmology checks.[22, 23] Mobile health clinics for HIV testing and counseling (HTC) have been used to increase coverage and meet needs that traditional facility-based HIV testing cannot.[24] Mobile HTC has been found to be highly acceptable among patients, however uptake has been variable in the literature.[25] Some studies

have found uptake and acceptability among vulnerable populations such as minorities, people who are homeless, uninsured or undocumented, those involved in prostitution, and people who inject drugs, to be promising.[26-30] Minimal published literature describes mobile health clinics used for continued HIV treatment domestically, however, mobile clinics have been used in New Haven, Connecticut to reach PLWH who inject drugs at needle exchange sites[31] and in Atlanta, Georgia to provide basic healthcare services, including HIV care, to people who are homeless.[32-34] In sub-Saharan Africa, there is some evidence of mobile health clinics being used to expand HIV services in rural areas in Mozambique,[35] Swaziland,[36] Kenya,[37] and in an ongoing clinical trial in South Africa and Uganda.[38]

Given the cumulative low effectiveness of existing strategies to retain PLWH in care, particularly vulnerable populations, there is a need to develop new methods to re-engage and retain PLWH in the treatment cascade that comprehensively address their needs and barriers to staying in care. Mobile health clinics have been shown to be highly acceptable and particularly effective at delivering a variety of health services among vulnerable populations who face barriers to accessing health care through traditional fixed-clinics.[29, 30, 39] These barriers include transportation and geographic barriers, financial costs, perceived absence of patient-centered care, clinic hours of operation, complexity of the healthcare system, and feelings of intimidation by healthcare settings.[22, 40] Delivering HIV care through a mobile health clinic presents a unique and potentially effective way to engage PLWH who are typically lost to follow-up and decrease the many barriers that still leave 51% of all PLWH out of traditional models of care in the U.S.[22, 26, 41] However, use of mobile health clinics within HIV care has been limited, with few examples in the published literature to inform successful design and implementation of a model within the U.S. Delivering HIV care on a mobile clinic presents potential challenges, such as the presence

of community-level stigma and need for confidentiality, which current mobile clinics delivering other health care services do not need to address. Therefore, qualitative research is first needed to understand key stakeholder preferences for a mobile HIV clinic model as well as the specific considerations necessary to deliver acceptable and feasible HIV care on a mobile health clinic. These key perspectives will be essential in order to inform the design and implementation of a mobile HIV treatment clinic to re-engage and retain PLWH who are out of care in Atlanta, Georgia and other U.S. settings. Establishing a new method to reach patients who have fallen out of care in Atlanta will potentially improve progress towards state and national HIV goals, help decrease the spread of the virus in a highly prevalent area, and could serve as a model for care elsewhere in the U.S.

Chapter Two: Comprehensive Literature Review

Retention in the HIV Treatment Cascade

Retention goals and implications

Retention in HIV care is an important precursor to viral suppression at an individual and population level and is one of the most important strategies for ending transmission of HIV in the U.S.[5] The National HIV/AIDS Strategy for the United States (NHAS) identifies four priority areas for national response to HIV. One of these priority areas includes working to achieve "broad support for people living with HIV to remain engaged in comprehensive care."[5] Nationally, the U.S. is falling short of its 2020 goal to retain 90% of people diagnosed with HIV. As of 2015, only 57.2% of those diagnosed with HIV were retained in care, falling short of the yearly target of 67.1%.[18] Retention in care is not only important to national targets and transmission prevention, but also vital to the individual health outcomes of PLWH. Viral suppression in PLWH reduces the morbidity and mortality of the infection, allowing patients to live longer, healthier lives.[5, 6] Retention outcomes differ by race and ethnicity, with African American patients falling 10 percentage points behind both Hispanic and White populations in HIV retention.[42]

Achieving NHAS 2020 goals has important implications economically and on a population health level. Meeting NHAS targets would avert 280,000 more HIV transmissions in the general U.S. population over 20 years, compared to outcomes if progress continues at the current pace.[43] This in turn will decrease the number of PLWH by 82,000, despite increased survival.[43] In addition, approximately 199,000 deaths will be averted over 20 years, with Black MSM contributing a greater proportion of deaths averted than their representation in the population.[43]

Achieving these targets has been shown to be cost-effective in the long run, with greater cost-effectiveness when implementing interventions specifically targeted at Black MSM in the U.S.[43] While short-term costs of HIV care may seem high due to the cost of antiretroviral therapy, in the long-term, retention in HIV care decreases health care costs by decreasing HIV progression, opportunistic illnesses, hospitalizations, and HIV transmissions, and increasing productivity and quality of life.[44] A single prevented HIV transmission in the U.S. saves the healthcare system $300,000-$500,000 over a lifetime.[44] This has enormous implications multiplied by the number of transmissions that can be prevented if we reach current retention targets. Modelling further shows that retention interventions have potential to be a more cost-effective way to improve outcomes than intervening at other levels on the HIV care continuum.[44]

State of Retention in the southern United States and Georgia

The greatest burden of HIV and related deaths out of any region in the U.S. is in the 16 states and District of Columbia that make up the South.[1] This region accounts for 52% of new HIV diagnoses while it is home to just 38% of the U.S. population.[1] African Americans make up a disproportionate number of HIV diagnoses in every risk group in the South, with Black MSM accounting for twice the number of new diagnoses than White and Hispanic/Latino MSM.[1] Black women are also disproportionately affected, making up 67% of new HIV diagnoses among all women in the South.[1] The South also has more people living with HIV who are undiagnosed and has higher mortality risks of people living with HIV than in other areas.[1] This heavy regional burden is driven by multiple factors—the South has the highest poverty rate, lowest median household income, and the largest proportion of uninsured people compared to other regions in the U.S.[1] In addition, medical mistrust,[19] HIV stigma, and stigma around sexual orientation, substance abuse and mental health disorders,[20] poverty, and sex work is pervasive in the South

and may be deterring the highest risk groups from seeking HIV care.[1] The CDC has expanded and strengthened its support for HIV prevention in the South, making it a focus in new prevention efforts.[1]

In Georgia there were 55,513 adults and adolescents diagnosed with HIV in 2017, 51% of whom were retained in care.[2] This puts Georgia in the lowest third quartile of states by retention in care.[18] Of those who were retained in care, 85% are virally suppressed in Georgia, indicating good outcomes if patients are retained in care.[2] The Georgia Department of Public health aims to increase the number of PLWH retained in care to 90% and improve retention in care for targeted populations by 50% by 2021.[21] One strategy to achieve those goals, outlined in the Georgia Integrated HIV Prevention & Care Plan 2017-2021, is to establish mobile units to facilitate access to care for African-American MSM and women, transgender females, and Hispanics.[21]

People Living with HIV in Atlanta, Georgia

Atlanta in particular has the second highest rate of HIV diagnoses of all metropolitan areas in the U.S. and had over 40,000 people living with HIV at the end of 2017.[3, 4] The Atlanta metropolitan area accounts for 66% of new diagnoses and 69% of PLWH in the state.[21] In Atlanta, 79% of PLWH are male, 66% are African American, and 63% of transmissions are among MSM.[21] Spatial analysis shows the HIV epidemic in Atlanta is clustered within 2 out of the 31 counties of metro Atlanta.[45] A disproportionately higher prevalence of the disease is centralized in downtown Atlanta and spread across 157 census tracts within the City of Atlanta.[45] Sixty percent of HIV cases in metro Atlanta were contained in this cluster and the HIV prevalence was 1.34% within compared to 0.32% outside the cluster.[45] The census tracts within the cluster had a higher population density and were associated with higher levels of poverty and a higher prevalence of HIV risk behaviors, including injection drug use and men having sex with

men, than those outside the cluster.[45] Retention in HIV care is an important outcome in the treatment cascade and there is a need to develop new methods to re-engage and retain PLWH who are out of care, especially in Atlanta, an epicenter of the US HIV epidemic.

Current Strategies for Retention in HIV Care

Barriers to retention

The reasons that PLWH fall out of care can be classified into three broad categories: healthcare system factors such as location of care, scheduling, and system navigation; social factors such as stigma, discrimination, and medical mistrust; and common individual barriers such as financial constraints, housing insecurity, mental health, trauma, and substance abuse.[16] PLWH who have fallen out of care indicate some common needs such as non-HIV medical services, housing, food, pharmacy services, mental health services, and dental services.[16]

In addition, lower retention in care has been associated with little social support, having mental health or substance abuse issues, feeling stigmatized, negative perceptions of the health care system, structural factors such as lack of health insurance, lack of transportation, fragmented HIV care services, poor provider communication skills, and clinic access issues.[7] All of these findings suggest that an intervention to improve retention should address patient, provider, social, and structural factors.[9]

Specifically in Atlanta, transportation availability and location of services are important to HIV retention. Analysis shows that most patients are centered in south Atlanta while the majority of HIV providers are found in north Atlanta, indicating a need for reliable transportation to remain in care.[46] However, Atlanta is rated one of the least transportation-accessible cities in the U.S.,[47] and patients in south Atlanta traveled longer and farther to attend HIV appointments.[46] In addition, spatial analysis of ZIP code approximated areas in Atlanta show that

low levels of community viral suppression are associated with high poverty, low car ownership, and greater number of bus stops.[48] While a greater number of bus stops might be assumed as an indicator of good transportation accessibility, another study in Atlanta also found that using public transportation was associated with lower rates of HIV care attendance compared to using private transportation.[46] These findings speak to the persisting inadequacies of the public transportation system and the significance of transportation as a barrier to care in Atlanta.

Among PLWH in Atlanta, about half report unmet basic survival needs such as food insufficiency, housing concerns, and transportation needs.[49] In a survey of 489 men and 165 women living with HIV in Atlanta, one in four patients reported having to choose between paying for food or medicine in the last six months.[49] Over half of patients reported using mental health counseling, but 10% reported an unmet need for mental health services.[49] Overall among men, a greater number of unmet service needs was associated with a newer diagnosis, higher CD4+ T-cell values, greater stressors and depression, and greater alcohol consumption.[49] Among women, a greater number of unmet service needs was associated with not receiving HIV medications and greater depression.[49]

Current strategies and effectiveness of these strategies

Improving retention in care is difficult because patients face many different barriers to care. Thus, the solution will not be one size fits all. Nationally, the most common interventions to improve retention in care include social support services, case management,[8] co-location of services, and appointment accompaniment.[9] Other interventions include additional services such as child care or housing services, appointment reminders, patient navigators,[10] peer support,[11] media such as brochures in the waiting rooms[12], outreach, and transportation support.[8, 9, 13-16] Most current retention interventions take place in medical settings; however, some interventions

take place in community-based organizations and few take place at patient residences, research offices, and community outreach settings.[9]

Based on a systematic literature review of interventions focused on linkage, retention, and re-engagement in HIV care, significant evidence-based retention interventions included: strengths-based case management, peer navigators, co-location of services, a notification system to alert providers when patients missed appointments, enhanced contact via in-person and phone reminders,[9] and clinic-wide educational messages.[7] Significant evidence-informed interventions included: counseling and psychosocial support, motivational interviewing, messages on the importance of staying in care, and help with appointment scheduling.[13-15] The Antiretroviral Treatment and Access Study, testing a strengths-based case management model, showed the most promising results for wider adoption.[13] Interventions utilizing peers also promoted access to and retention in HIV care.[9] Effective peer interventions varied and included frequent contact, life-skills development, appointment accompaniment, counseling and education, and assessment and help with unmet needs.[9] Most studies used multiple intervention strategies, which proved to be effective at addressing the multiple barriers patients face in staying in HIV care.[9] Notably, none of the eligible studies reported on outcomes of re-engagement.[13]

Many of these interventions have shown promising results, however, the continued shortcomings in reaching retention targets necessitate research into new models of re-engagement and retention strategies specific to the needs of patients who have fallen out of care.[17, 18] Most interventions for retention in care are targeted at individual-level behavior and in medical settings.[9] Retention strategies targeting structural or system barriers could be improved and interventions utilizing community-based organizations could be better assessed.[9] Traditional HIV care delivered in clinic-based settings has had success, however, to meet the needs of those

that have fallen out of these traditional models of care, as well as address challenges of overburdened health systems, lack of patient-centered care, and resource limitations, new strategies outside of traditional HIV care should be considered.[17] Task-shifting and decentralization have resulted in increased HIV service delivery and have been endorsed by bodies such as the World Health Organization.[17] These strategies, which could be delivered as community-based models of care, have the potential to increase the number of PLWH who have access to services and retain patients who face social and economic barriers to receiving care in traditional clinic settings.[17]

Mobile Health Clinics

What are they?

Mobile Health Clinics are models of health care delivery, typically offered on a van, bus, or other vehicle, that can move to different locations to provide medical services directly in a community. They can be used as a way to deliver health care outside of traditional clinic-based settings. Mobile health clinics have been used for delivering a variety of health services in community settings and have been successful in improving access to health care, especially among vulnerable populations.[22]

Mobile health clinics have the potential to overcome barriers to health care access that patients, especially vulnerable and minority patients, face. This includes transportation and geographic barriers, financial costs, perceived absence of patient-centered care, clinic hours of operation, complexity of the healthcare system, and feelings of intimidation by healthcare settings.[22, 40] Mobile clinics have been able to restore trust with patients who have been disenfranchised by the health care system because patients can often feel more comfortable within their own communities and the effort taken to deliver patient-centered care is seen

favorably.[22] Additionally, mobile clinics present a way to reach patients that are less likely to seek health services in traditional clinic settings because of mental health or substance abuse comorbidities. Finally, mobile clinics have potential to improve the quality of health care delivered because they can improve health care providers' understanding of the social determinants of health that affect patient outcomes and engagement by observing patients in their home environments.[22]

The Centers for Disease Control and Prevention (CDC) has identified three types of interventions to improve population health: traditional clinical preventive interventions, innovative preventative interventions that extend care outside the clinic setting, and community-wide interventions.[22] Mobile health clinics integrate all three types – implementing traditional clinical care into a non-traditional community setting, with the ability to reach a wider population.[22]

Acceptability, feasibility, effectiveness, and current use of mobile health clinics

Mobile Health Map, a program funded originally by the Health and Human Service and the Office of Minority Health and now operated by the Family Van Program at the Harvard Medical School, monitors and measures the impacts of mobile health clinics in the United States.[23] They estimate about 2,000 mobile health clinics exist in the U.S., 789 of which have joined their virtual mobile health map online.[22] Their aggregated data indicates that mobile health clinics provide up to 6.5 million health care visits per year – 42% of which offer primary care, 45% offering preventative health screenings, 30% offering dental services, and others offering specialty care such as mammography, mental health monitoring, and ophthalmology checks.[22]

Mobile health clinics are particularly useful in reaching minorities, high-risk or stigmatized populations, and vulnerable populations such as people who are homeless or displaced, immigrants, under-insured patients, and children.[22] Although men usually have poorer health-seeking behaviors than women, mobile health clinics have been found to serve equal proportions of male and female patients.[22] Mobile clinics on Mobile Health Map primarily serve the uninsured and publicly insured, with just 9% serving privately insured individuals.[23] The lowest-income communities are more likely to visit the emergency department when they need health care, and mobile health clinics offer a cost-saving alternative to prevent emergency room visits.[22, 40]

Mobile health clinics have been shown to be highly acceptable and effective among vulnerable populations. A women's health van serving communities with a large number of undocumented immigrants and uninsured found that patients accessing prenatal care at the van initiated care an average of 3 weeks earlier than patients accessing prenatal care at traditional clinics.[29] On community attitude surveys, a mobile clinic used for HIV testing and STD testing and treatment in a high incidence area in Baton Rouge, Louisiana found that 97% of respondents thought neighborhood STD testing was a "good" or "very good" idea.[39] Of those that had seen or heard of the van, 61% had used the van for services and 87% said they would use a van in their neighborhood for STD testing services.[39] Implementors found that the project also strengthened the relationship between communities and the health department.[39]

Among people who inject drugs (PWID) seeking healthcare services, a mobile health clinic screening and vaccinating for Hepatitis B virus next to a syringe exchange site was highly successful. Completing all 3 vaccinations on the mobile van was associated with injecting drugs daily and being homeless, indicating high acceptability among a vulnerable population.[30]

Reaching the most vulnerable populations is an important goal in health care delivery, especially for people living with HIV.[7, 50] These populations face the most barriers to health care access, often have worse health outcomes, and have needs that are not being met by traditional models of health care delivery.[7] Improving health care access among the most vulnerable can help decrease health disparities that persist by race, income level, and other factors.[43] Mobile health clinics present a unique way to engage groups of people that are typically lost to follow-up and decrease the many barriers to care that they face.[22, 26]

Mobile health clinics used for HIV testing, counseling, and linkage to care

Mobile Health Clinics for HIV testing and counseling (HTC) have been used to increase coverage and meet needs that traditional facility-based HIV testing cannot. Providers and staff from eight community-based organizations that provide mobile HTC across the U.S. agreed that mobile testing units improved their capacity to reach high-risk individuals and enabled their organization to offer testing in areas that were previously inaccessible.[24]

Mobile testing has also been found to be highly acceptable among patients, with 87% out of an aggregated pool of 79,475 participants from studies in a systematic literature review accepting an offer for mobile HTC.[25] However, mobile HTC uptake among key populations ranged from 9% to 100% because of highly variable approaches related to how testing was offered.[25] Overall, first-time testers were more likely to have used community-based HTC over facility-based settings, however the results among studies were mixed.[25] Some studies found first-time testers more likely to have used community-based settings,[28] while others found this population more likely to use facility-based testing.[25] The rate of positive HIV tests was also mixed. Overall a systematic review found a lower HIV positivity rate in community-based compared to facility-based testing and the HIV positivity rate varied among key populations.[25]

However, some studies found that the percentage of patients who agreed to undergo an HIV test were much higher at a mobile testing site than at a traditional clinic and the percentage that tested positive was higher as well, indicating the mobile testing site as a more effective way to reach the most at-risk HIV-positive patients for testing.[22] Other at-risk patients, including Black or Hispanic patients, uninsured, those involved in prostitution, and PWID were found to be more likely to use mobile HTC than traditional clinic testing.[26, 27] Another evaluation of a mobile counseling and testing program to reach people of color in Seattle, Washington found that mobile testing reached a greater percentage of people of color, first time testers, people younger than 20 years old, people with a high school education or less, and substance users in the past month, compared to health department testing.[28] Various evaluations of mobile HTC programs describe facilitators and barriers to uptake. One evaluation found that providing movie tickets and food did not increase program utilization, but after community feedback, $10 incentives increased testing rates four-fold, and increased the number of new cases of HIV identified by five times.[28]

Mobile HTC that was included as a part of multi-disease campaigns such as vaccinations, malaria bed nets, and screenings for cardiovascular disease, diabetes, and pulmonary disease was able to cover the highest proportion of those living in an area served, in the shortest amount of time.[25] The cost per person for mobile testing ranged from US$3.26 to US$33.52 and adding other preventative interventions and health screenings improved the cost-effectiveness.[25] Providers involved in mobile HTC thought that mobile testing units were worth the monetary investment but also cited cost as a substantial challenge.[24] Other common feasibility challenges cited include finding adequate parking, finding qualified drivers, and locating patients to share

confirmatory results once they left the mobile health clinic.[24] Privacy was not a challenge cited by providers, with most agreeing that privacy was adequate on mobile HTC units.[24]

Methods used to promote mobile testing units include posting signs on the mobile unit, posting or distributing promotional materials in targeted areas, print advertising, partnering with other organizations for client referrals, working with community gatekeepers, and television and radio advertising.[24] Program staff interviewed from eight community-based organizations implementing rapid HIV testing rated all of these methods highly effective, with 96% of respondents reporting working with community gatekeepers was effective, 94% reporting posting signs on mobile testing units was effective, and 92% reporting distributing materials in targeted areas was effective.[24]

Mobile health clinics used for HIV treatment

Within HIV care in the U.S., mobile clinics have primarily been used for testing and linkage to care. Minimal published literature describes use for continued HIV treatment domestically.[39, 51] In New Haven, Connecticut, a mobile clinic is used to reach PLWH who inject drugs, at needle exchange sites. The clinic, which began providing services in 1993 in tandem with the New Haven Needle Exchange Program, is 36-feet long with two exam rooms and one counseling room.[31] It travels to five neighborhoods within New Haven, providing HIV counseling, case management, drug treatment coordination, health status assessment, acute medical care, and linkage to other medical care, all free of charge.[31] It is staffed by a clinician, a drug treatment coordinator, outreach workers, an HIV counselor, and various volunteers.[31]

In a pilot study of the program, the mobile clinic provided HIV therapy to people who actively used heroin who were willing and eligible to initiate treatment but were not already receiving HIV therapy and were not interested in formal drug treatment.[31] There were 13

participants, who each had a tailored drug regimen linked to their heroin use, developed after discussion with the mobile clinic providers.[31] During the course of the study, patients had weekly scheduled appointments on the mobile clinic, at a site close to the patient's residence.[31] All participants completed a 12-month course of therapy, and of those, 11 (85%) had undetectable viral loads at six months, 10 (77%) had undetectable viral loads at nine months, and seven (54%) had undetectable viral loads at 12 months.[31] Mean CD4 count among participants increased from 265 cells per mL at baseline to 416 cells per mL at 12 months.[31] Additionally, by the end of the study, nine participants (69%) chose to enter drug treatment, which was associated with persistence of viral suppression.[31] This small pilot study suggests that mobile HIV treatment may help improve health outcomes for people living with HIV who actively inject drugs, a population that faces barriers to receiving care at traditional clinics due to lifestyle, mistrust, and inaccessibility. By offering a trusted avenue for HIV care, the mobile clinic also facilitated positive health behaviors in patients, such as seeking drug treatment.

Another mobile clinic providing HIV treatment domestically is Mercy Care's Mobile Health Program and Street Medicine Program in Atlanta, Georgia. The Mercy Mobile Health Program was started in 1985 to provide basic healthcare services to people who are homeless in Atlanta.[32] The program has four vans and two mobile clinics, operates five days and three evenings a week, and provides more than 50,000 episodes of care a year, all free of charge.[32] Nurse practitioners serve as the primary care providers, with physicians serving as clinical consultants; social workers, educators, outreach workers, and volunteers also staff the mobile clinic.[32] The HIV care the mobile units provide, with federal Ryan White funding, includes primary care, disease prevention, case management, and education and referral.[32] The mobile program partners with local organizations such as AID Atlanta, Project Open Hand, and Grady

Memorial Hospital's Infectious Diseases Clinic to provide additional social services, meals, and case consultation to people living with HIV who are homeless.[32] Other funding sources for the mobile program include endowments from foundations, government grants, individuals, and corporations, as well as Saint Joseph's hospital of Atlanta.[32] Additionally, Mercy Care's Street Medicine program was started in 2013 to engage homeless people in consistent physical and mental health care, directly in the places they live and sleep.[33] They operate on week days and nights, traveling to different locations throughout Atlanta during that time.[34] The Street Medicine mobile clinic is staffed by a psychiatrist, nurse practitioner, registered nurse, healthcare students,

Table 1: Key characteristics of mobile health clinics used for HIV treatment found in published literature

Description	Location (year started)	Patient population	Providers on the mobile clinic	Frequency	Funding
Mobile HIV units to establish care at rural clinics	Mozambique (2012)	Rural PLWH	Health officer, maternal child health nurse, pharmacy technician, counselor	4x a week, every other week	Real Medicine Foundation, PEPFAR
Mobile ART refills	eSwatini (2015)	Rural PLWH who are stable	No Information	No Information	eSwatini Ministry of Health; Medecins Sans Frontieres
Semi-mobile clinics	Kenya (2002)	PLWH who opted into mobile treatment	Nurse, clinical officer, social worker	1x a month	HealthRight International
Current clinical trial examining mobile ART monitoring and resupply	South Africa; Uganda (2016)	Rural PLWH	No Information	No Information	University of Washington; Bill and Melinda Gates Foundation
Mobile clinic for people who are homeless	Atlanta, Georgia (1985; 2013)	People who are homeless	Psychiatrist, nurse practitioner, registered nurse, healthcare students, and a case manager team	5 days a week; 3 evenings a week	Mercy Care; Saint Joseph's hospital of Atlanta; foundations; government grants; individuals; corporations
Mobile clinic at needle exchange sites	New Haven, Connecticut (1993)	PWID	Clinician, drug treatment coordinator, outreach workers, HIV counselor, volunteers	1x a week per patient enrolled in study	The New Haven Needle Exchange Program

and a case manager team.[34] The Street Medicine team utilizes telemedicine to fulfill staffing needs while providing care on the street.[34]

In sub-Saharan Africa, there is some evidence of mobile health clinics being used to provide HIV treatment in rural populations.[35, 36, 38] Key characteristics of mobile health clinics used domestically and internationally for HIV treatment described in the literature are outlined in Table 1.

In Mozambique, the Ministry of Health used a mobile health clinic as a way to expand HIV treatment to rural areas and quickly build capacity of fixed clinics to begin HIV care services in Zambézia Province.[35] The mobile clinic, built on a four-wheel drive truck, was 20.6 feet in length and comprised of two rooms inside as well as two side tents that provided additional space for HIV counselling and testing.[35] One room inside was equipped for clinical services and the other for pharmacy services.[35] When deployed, the mobile clinic offered HIV care and treatment; on-site CD4+ T-cell and hemoglobin measurements; activities to address retention in care before and after ART initiation; tuberculosis diagnosis and care; malaria, diarrhea, and malnutrition management; and targeted maternal and child health care.[35] The mobile clinic was staffed by a non-physician health officer, a maternal child health nurse, a pharmacy technician, a counselor, and a driver.[35] It operated from Monday to Thursday and alternated weekly between two fixed clinics.[35] Partnerships with community organizations and leaders prior to and during roll-out of the HIV mobile health clinics was key to acceptance of this model.[52] Prior to implementation, community leaders, patients, providers and other key informants were surveyed and found to be receptive to the idea of a mobile HIV clinic.[52] In addition, at each new site the mobile clinic was launched with a health fair where community leaders were invited to speak about the importance of HIV testing and treatment.[35] Overall this

model was successful at quickly expanding HIV treatment to high-priority, rural clinics that were not previously delivering HIV care. Between April 2012 and the end of 2013, the Ministry of Health was able to expand ART services from two to six clinics and enroll 1,468 new patients in care as a result of the MHC.[35] Although this MHC was not designed for long-term patient care but rather short-term care until fixed clinics were able to complete training and increase capacity to deliver HIV services, it is a successful example of HIV treatment delivery using a mobile unit.

In 2015, community-centered ART refill models were introduced in the rural Shiselweni region of Swaziland for patients who were stable on ART, in an effort by the Swaziland Ministry of Health and Medecins Sans Frontieres to decentralize HIV and TB care, relieve the burden on health facilities, and reduce travel time and costs for patients.[36] One model, comprehensive outreach care, integrated ART drug refills into existing mobile clinic outreach that provided antenatal, child health, and HIV testing services at two remote sites.[36] Although the implementation of this HIV outreach model and mobile clinic was not described, the published study describes a retrospective analysis of retention in care and retention in ART outcomes of this model compared to two other community-centered ART models, community ART groups (CAGs) and facility-based adherence clubs.[36] Using comprehensive outreach care, 86.3% of patients were retained in care at 12 months, compared to 70.4% of patients retained using CAGs and 90.4% using adherence clubs.[36] Retention in ART was over 90% for all three models of community-centered ART refills and there was no significant difference between them.[36] The applicability of these findings to the possibility of using mobile HIV treatment to improve retention in care in the U.S. is limited because of its focus on patients who are the most stable on ART, however it shows high acceptability and feasibility of mobile HIV outreach care even in a low-resource setting.

In 2002, a semi-mobile clinic was implemented in Kenya by the non-profit HealthRight International to provide HIV care to patients in four communities who were currently being served by a regional hospital clinic 15 km away.[37] After an initial visit to the hospital, HIV-positive patients were offered a choice to continue care at the hospital or switch to care at a semi-mobile clinic closer to their home.[37] The semi-mobile clinic visited each community once a month and was staffed by at least one nurse, one clinical officer, and one social worker, all of whom were a part of the same clinical team that treated patients at the hospital.[37] At the semi-mobile clinic, patients received clinical monitoring, including height and weight checks, medication, counseling, support services including support groups and food distribution, and testing and treatment for opportunistic infections.[37] In a retrospective analysis of patient data for those seen by the hospital or semi-mobile unit between 2002 and 2007, there was no difference in outcomes of retention, adherence, change in CD4 count, or mortality between groups.[37] However, patients who chose to receive care at the semi-mobile unit were on average older, less educated, poorer, traveled longer to get to the hospital, and had a lower CD4 count if they were not already on ART.[37] Finding similar health outcomes despite baseline characteristics that are usually associated with worse health, indicates that the semi-mobile clinic model is an appropriate alternative care option among those that face poverty, transportation, or health barriers to coming in for regular hospital treatment.[37] Investigators also posit that patients attending the semi-mobile clinics may have been motivated to seek care because of the extra support services and food offered, but that the clinic alone was not sufficient to promote the importance of retention and adherence to ART.[37]

An on-going clinical trial, the Delivery Optimization for Antiretroviral Therapy Study (DO ART Study), sponsored by the University of Washington in collaboration with the Bill and

Melinda Gates Foundation, is examining community-based ART delivery among PLWH in South Africa and Uganda.[38] Investigators are working with the local Department of Health, community members, stakeholders, and local providers to integrate mobile ART monitoring and resupply into HIV clinics, pharmacies, and labs.[38] Three ART delivery arms will be compared: home ART initiation and mobile van monitoring and resupply; clinic ART initiation and mobile van ART monitoring and resupply; and standard of care clinic ART initiation, monitoring, and resupply.[38] This clinical trial started in April 2016 and will be completed in May 2020 and will provide an evaluation of a decentralized ART delivery strategy to deliver ART and monitor viral suppression among PLWH.[38] The primary outcomes are the proportion of HIV-positive patients who initiate ART and achieve viral suppression, and the cost per HIV-positive patient with a suppressed viral load at 12 months.[38] Secondary outcomes assessed will be safety, social harms, acceptability, and drivers of engagement in care.[38]

Mobile health clinics in in Atlanta, Georgia

Mobile Health Map shows 24 mobile health clinics in the Atlanta area, providing services such as asthma testing and care,[53] pediatric primary care,[54, 55] breast cancer screening,[56] primary care, medical and psychiatric care for the homeless,[34] pregnancy testing and care,[57, 58] and concussion and sports medicine care.[59]

One notable mobile health clinic in Atlanta is Mercy Care's medical mobile coach, which provides primary care, behavioral health services, and screenings for vision, blood pressure, diabetes, breast and cervical cancer, HIV, and TB to people living on the street in Atlanta.[60] The Fulton County Board of Health also operates a mobile health clinic delivering HIV testing, STI screenings, PrEP assessments and referrals, and other minimal health screenings through the

High Impact HIV Prevention Program.[61] Many additional community-based organizations offer HIV testing and counseling through mobile health clinics.

Summary of Current Literature and Gaps

There is a need to improve retention and reengagement outcomes for PLWH in the United States in order to improve individual health outcomes and meet national targets for epidemic control. Currently, evaluations of retention interventions show mixed results and there is a lack of attention to re-engagement interventions in the literature.[13]

Evidence exists of mobile health clinics being used effectively to reach vulnerable populations for a variety of health outcomes but their use within HIV care has been limited to uses such as HIV testing, counseling, and linkage to care, primary care reaching vulnerable populations such as the homeless or PWID, and ARV distribution and HIV care for rural populations in international settings. Often HIV care in mobile settings is implemented as an addition to a different primary service goal – STD screening, dental services, primary care, or syringe exchange. There is a lack of evidence on the use of mobile clinics primarily for HIV care and retention, so research is needed to determine whether mobile HIV treatment could be an acceptable and feasible alternative care option for people living with HIV who have fallen out of care in U.S. settings.

Current literature of mobile HIV clinics describes models that include multi-disciplinary treatment teams of nurses, counselors, case managers, social workers, and others that support PLWH who need assistance beyond medical care. The timing and frequency of existing models varies widely, from one time per month to multiple days per week, and is highly dependent on the target population and goals of the clinic. Multiple clinics described a large benefit in engaging the community to inform implementation and achieve acceptance. Many offered

additional health services or incentives beyond their primary medical goal, in order to attract patients and maximize their benefit. One way these clinics are able to offer these additional health services is by using diverse funding sources. In fact, HIV services have been offered in mobile settings often when delivering another health service has been the primary objective, for example, at mobile syringe exchange sites and during mobile primary care visits for people who are homeless. In this way, diverse funding sources could also be utilized to offer additional health services alongside HIV primary care in a mobile setting, such as mental health support, nutritional support, non-HIV related health screenings, or many other services. This possibility should be explored to determine patients' needs and preferences for other health services alongside mobile HIV care.

Given the high burden of the HIV epidemic in the South and the evidence of potential benefits to implementing mobile HIV care, research is needed to determine the acceptability and feasibility of this model specifically in this context. Stigma towards PLWH is still high in the South and affects patients' decisions to seek or not seek care. For this reason, patient confidentiality is especially important when delivering HIV care and presents a new challenge for mobile health care. While mobile health care is often used to reach rural settings, implementing a large mobile medical van in an urban city poses potential problems such as spatial and zoning constraints. Qualitative research to explore these and other considerations will help inform if and how a mobile HIV treatment model can be implemented in Atlanta, Georgia. Specifically, implementation of a mobile HIV treatment clinic requires understanding of patient perspectives regarding the acceptability of this model; clinic provider and staff perspectives regarding the acceptability and feasibility of this model as well as provider needs for delivering HIV care in this way; CBO/ASO staff perspectives regarding the acceptability and feasibility of

providing HIV care in local communities; Community Advisory Board (CAB) member perspectives regarding acceptability and potential implementation strategies; hospital regulatory, legal, and compliance officer and city official perspectives regarding logistic, legal, and compliance questions; and existing mobile health clinic staff perspectives on feasibility and potential implementation strategies. Exploring the unique perspectives and expertise that each of these stakeholders can provide is imperative to filling in the major knowledge gaps in how mobile HIV treatment can be implemented in an acceptable, feasible, and safe manner.

Chapter Three: Manuscript

Key Stakeholder Perceptions of a Mobile HIV Care Model to Re-engage and Retain Out-of-care People Living with HIV in Atlanta, Georgia

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Contribution of Student

I am the primary author of this paper. I participated in the development of study protocols and the interview guides, revising of the protocols and guide based on the feedback of the Community Advisory Board, conducted 11 in-depth interviews, transcribed 6 interviews, quality checked 10 interview transcriptions, coded 14 interviews, and analyzed all 36 interviews included in this study. I wrote this thesis with the guidance of my thesis advisor, Dr. Ameeta Kalokhe.

Abstract

Background: To reach national targets, novel strategies to re-engage and retain people living with HIV (PLWH) who are out of care are greatly needed. While mobile clinics have been used effectively for HIV testing and linkage, their use in providing HIV care is limited in the published literature. To guide the development of a mobile HIV clinic (MHC) model as a strategy to re-engage and retain PLWH who are out of care, we aimed to first explore key stakeholder perceptions and preferences for MHC implementation.

Methods: From June 2019-December 2019, as part of a larger mixed-methods study, 36 in-depth interviews were conducted with HIV clinic providers, staff, legal authorities, administrators, and Community Advisory Board members, AIDS service organizations, organizations implementing mobile health care, and city officials in Atlanta. Thematic analysis was used to examine perceived advantages, barriers, and facilitators of successful MHC implementation.

Results: Many supported use of MHCs if a few critical barriers were addressed (i.e. potential breach of confidentiality with resulting stigma, fractured continuity of care, safety concerns, staffing challenges, and community acceptance), and noted advantages (i.e. convenience, patient-centered care, potential to improve provider/staff understanding of patients' environments and display their commitment, and greater community reach). Participants provided suggestions (i.e. appropriate exterior design, MHC location and timing, and co-delivery of non-HIV services) that would facilitate MHC implementation and address key concerns.

Conclusions: MHCs have potential to be acceptable, effective means of re-engaging and retaining PLWH who are out of care. By identifying barriers and strategies to overcome them, this study informs the design of future MHCs and enables further research to test their effectiveness in improving re-engagement and retention among PLWH who are out of care.

Introduction

The 16 states and District of Columbia that make up the South bear the greatest burden of HIV and related deaths out of any region in the U.S.[1] This region accounts for 52% of new HIV diagnoses while it is home to just 38% of the U.S. population.[1] Georgia in particular had 55,513 adults and adolescents diagnosed with HIV in 2017, 51% of whom were retained in care.[2] The Atlanta metropolitan area had over 40,000 people living with HIV (PLWH) at the end of 2017 and has the second highest rate of HIV diagnoses of all metropolitan areas in the U.S.[3, 4]

Retention in HIV care is an important precursor to viral suppression at an individual and population level and is one of the most important strategies for ending transmission of HIV in the U.S.[5] Viral suppression in PLWH reduces the morbidity and mortality of the infection, allowing patients to live longer, healthier lives.[5, 6] However, improving retention in care is difficult because patients face many different barriers to care at the individual level (i.e. insurance status, lack of transportation, financial constraints, housing insecurity, mental health or substance abuse comorbidities), interpersonal level (i.e. lack of social support), and community level (i.e. presence of stigma, accessibility of healthcare services, social norms, poverty).[7] Nationally, common interventions to improve retention in care include social support services, case management,[8] co-location of services, appointment accompaniment,[9] additional services such as child care or housing services, appointment reminders, patient navigators,[10] peer support,[11] media such as brochures in the waiting rooms[12], outreach, and transportation support.[8, 9, 13-16] Many of these interventions have shown promising results, however, the continued shortcomings in reaching retention targets necessitate research into new re-engagement and retention strategies specific to the needs of patients who have fallen out of care.[17, 18] Most interventions for retention in care are targeted at individual-level behavior and in medical settings; strategies targeting structural or system barriers could be improved and interventions utilizing community-based

organizations could be better assessed.[9] In addition, new strategies outside of clinic-based HIV care should be considered to meet the needs of those that have fallen out of traditional models of care, as well as address challenges of overburdened health systems, lack of patient-centered care, and resource limitations.[17]

In the South, medical mistrust,[19] pervasive HIV stigma, and stigma around sexual orientation, substance abuse and mental disorders,[20] poverty, and sex work, may be deterring the highest risk groups from seeking and remaining in HIV care.[1] The Georgia Department of Public Health aims to increase the number of PLWH retained in care to 90% and improve retention in care for targeted populations by 50% by 2021.[21] One strategy to achieve those goals, outlined in the Georgia Integrated HIV Prevention & Care Plan 2017-2021, is to establish mobile units to facilitate access to care for African-American men who have sex with men (MSM) and women, transgender females, and Hispanics.[21]

Mobile health clinics are models of health care delivery, typically offered on a van, bus, or other vehicle, that can move to different locations to provide medical services directly in a community rather than in a traditional, clinic-based setting. Mobile health clinics have been used for delivering a variety of health services and have been successful in improving access to health care, especially among vulnerable populations.[22] Presently in the U.S., mobile health clinics are being used to provide medical services such as primary care, asthma care and control in children, maternal and infant health services, prevention screenings, dental services, and some specialty care such as mammography and ophthalmology checks.[22, 23] Mobile health clinics for HIV testing and counseling (HTC) have been used to increase coverage and meet needs that traditional facility-based HIV testing cannot.[24] Mobile HTC has been found to be highly acceptable among patients, however uptake has been variable in the literature.[25] Some studies

have found uptake and acceptability among vulnerable populations such as minorities, people who are homeless, uninsured or undocumented, those involved in prostitution, and people who inject drugs, to be promising.[26-30] Minimal published literature describes mobile health clinics used for continued HIV treatment domestically, however, mobile clinics have been used in New Haven, Connecticut to reach PLWH who inject drugs at needle exchange sites[31] and in Atlanta, Georgia to provide basic healthcare services, including HIV care, to people who are homeless.[32-34] In sub-Saharan Africa, there is some evidence of mobile health clinics being used to expand HIV services in rural areas in Mozambique,[35] Swaziland,[36] Kenya,[37] and in an ongoing clinical trial in South Africa and Uganda.[38]

Given the cumulative low effectiveness of existing strategies to retain PLWH in care, particularly vulnerable populations, there is a need to develop new methods to re-engage and retain PLWH in the treatment cascade that comprehensively addresses their needs and barriers to staying in care. Mobile health clinics have been shown to be highly acceptable and particularly effective at delivering a variety of health services among vulnerable populations who face barriers to accessing health care through traditional fixed-clinics.[29, 30, 39] These barriers include transportation and geographic barriers, financial costs, perceived absence of patient-centered care, clinic hours of operation, complexity of the healthcare system, and feelings of intimidation by healthcare settings.[22, 40] Delivering HIV care through a mobile health clinic presents a unique and potentially effective way to engage PLWH who are typically lost to follow-up and decrease the many barriers that still leave 51% of all PLWH out of traditional models of care in the U.S.[22, 26, 41] However, use of mobile health clinics within HIV care has been limited, with few examples in the published literature to inform successful design and implementation of a model within the U.S. Delivering HIV care on a mobile clinic presents potential challenges, such as presence of

community-level stigma and need for confidentiality, which current mobile clinics delivering other health care services do not need to address. Therefore, qualitative research is first needed to understand key stakeholder preferences for a mobile HIV clinic model as well as the specific considerations necessary to deliver acceptable and feasible HIV care on a mobile health clinic. These key perspectives will be essential in order to inform the design and implementation of a mobile HIV treatment clinic to re-engage and retain PLWH who are out of care in Atlanta, Georgia. Establishing a new method to reach patients who have fallen out of care in Atlanta will potentially improve progress towards state and national HIV goals, help decrease the spread of the virus in a highly prevalent area, and could serve as a model for care elsewhere in the U.S. Therefore, this thesis aims to examine the barriers and facilitators to the use of MHC as a means of reengaging and retaining PLWH who have fallen out of care.

Methods

Overview

This thesis summarizes the qualitative component of a larger mixed-methods parent study that aims to explore the perceived needs, barriers, and facilitators to implementation of a mobile HIV treatment clinic for PLWH who are out of care and identifying strategies to enhance its acceptance, feasibility, safety, and efficacy as an alternative HIV treatment delivery model. The goal of this formative research was to inform the development of a patient- and program-tailored implementation plan for a mobile HIV treatment clinic model that leverages existing resources and integrates seamlessly into the existing national Ryan White Program structure. As part of the qualitative phase, in-depth interviews were conducted with patients and other key informants from June 2019 through December 2019 to understand the potential of mobile HIV treatment as an alternative treatment model for PLWH who have fallen out of care and to explore various

stakeholder perspectives of how this model could be implemented in Atlanta, Georgia. Qualitative research methods were chosen to gather in-depth, rich data from a variety of perspectives about this new model of care. The exploratory nature of qualitative research was important to utilize because of the lack of previously published literature describing mobile HIV clinics and the importance of context-specific knowledge in designing and implementing safe and effective HIV care.

Study Setting

This study took place at a large Infectious Diseases clinic and surrounding agencies that provide HIV support services in Atlanta, Georgia. The clinic receives Ryan White Program (RWP) funding to provide comprehensive HIV care and support services for un- or underinsured PLWH each year, including HIV clinical care, laboratory services, psychosocial support, medication assistance, nutrition services, case management, and food and transportation assistance. The southern region of the United States, where this study took place, has the greatest burden of HIV-related deaths and new HIV diagnoses out of any region in the U.S., and Atlanta is an epicenter of the epidemic within the South.[1] The epidemic in Atlanta in particular is centralized in Fulton and Dekalb counties, where the clinic is located and where the majority of patients reside.[45] Additional information about the patient population the clinic serves are not presented here to reduce potential of identifying the clinic.

Eligibility and Participant Recruitment

There were six categories of participants recruited for this substudy: clinic providers and staff, Community Advisory Board (CAB) members, community-based organization and AIDS service organization (CBO/ASO) staff, hospital legal, compliance, and regulatory officials, city officials, and staff of existing mobile health clinic programs. (Patient perspectives, while

included in the larger mixed-methods study, are not included in this thesis as enrollment of this subgroup was not completed at the time of analysis).

The six categories of participants, key informants, were purposively sampled to represent a diversity of positions, experiences, and organizations within the Atlanta community that work with PLWH or have specific expertise with programs directed towards PLWH. Clinic providers and staff worked at the clinic where the study took place and were recruited through direct contact by the research team through email and advertising through an internal newsletter until saturation was reached. CAB members were recruited through direct contact by the research team. These participants were previously aware of the study as they were consulted on the design and protocol of patient surveys and interviews. CBO/ASO staff were recruited purposively to represent organizations working with PLWH from a variety of demographics – MSM, women, transgender women, under- and uninsured, and insured patients. CBO/ASO staff members were recruited through direct contact by the research team and chosen because of their known provision of support services within RWP and their work on prior studies. Hospital legal, compliance, and regulatory officials were recruited through clinic RWP contacts for their specific roles providing expertise on hospital regulations. Additional hospital regulatory officials were referred by existing participants and all were contacted directly by the research team through email. City officials with knowledge of zoning and regulations were searched for through the online city directory and research staff reached out through email to seek interest. Additional city officials were recruited by referral for specific expertise and knowledge. Existing mobile health clinics were found through literature searches and knowledge of mobile health care in Atlanta. Organizations providing mobile health care (HIV and non-HIV) in Atlanta and

organizations providing HIV-specific mobile care anywhere were recruited directly by the research team through email.

Study Procedures

Study protocols were developed by the research team and reviewed by the CAB. Revisions were made at the advice of the CAB to make the survey and interviews more comfortable for patients when discussing sensitive topics. Recommended changes included reducing the time of patient interviews in order to prevent fatigue and adding visual aids when explaining new alternative treatment models. Before data collection began, all members of the research team were trained on the study protocols to ensure standardization of procedures.

Patient participants first completed a 30-minute survey examining their preferences for various HIV care models (as part of the parent study) prior to being offered to participate in the additional 1-hour in-depth interview. Surveys and interviews were conducted at the clinic or at an off-site private location and time convenient to the patient. Examples of off-site locations included a public library and an in-patient hospital setting.

Other key informants directly participated in the 1-hour in-depth interviews (i.e. did not complete a prior survey). Interviews were all conducted by a trained member of the research team. They were conducted at various locations, including the clinic, the organization where the participant worked, and sometimes by phone or video conference when participants were unable to meet in person. The average duration of the interviews across all participants was 47 minutes.

All patient and key informant interviews were recorded by two audio recorders to be transcribed verbatim later. All interviews followed semi-structured interview guides that were specific to each participant category and interviewers were instructed to probe for detailed answers. Specific interview topics are discussed below and interview guides can be found in

Appendix A. Before and during the interviews, interviewers built rapport with participants by making conversation to make participants feel comfortable before discussing sensitive topics.

Research staff obtained written informed consent from each participant before the beginning of each survey and interview. Participants were informed of the purposes of the study, the risks and benefits of participating, compensation available, and all study confidentiality protocols. All surveys and interviews were conducted in private locations where others could not overhear. Interviewers were instructed to switch to another non-sensitive topic if privacy was broken during the survey or interview. Research staff informed participants that they had the right to leave the study at any time and were reminded throughout the survey and interview that they could choose to not answer any question, especially when asking about possibly sensitive topics. Compensation of $50 was offered after each interview. Full study protocols are included in Appendix B.

Interview content

Semi-structured interview guides were developed for each of the six participant categories. Interview guides included open-ended, general questions about preferences for improved HIV care for patients who have fallen out of care, and specific questions about their opinions on mobile HIV treatment as an alternative care model. Participants were asked what advantages and barriers this model would have, as well as implementation preferences (i.e. regarding venue, timing, branding, clinical and support service provision) to make mobile HIV treatment more acceptable, feasible, and safe.

Interview guides were structured based off of the patient interview guide but were tailored for each specific position and experience. Clinic providers and staff were interviewed on perceived barriers and facilitators to care for their patients, and needs and preferences for

delivering HIV care in their preferred community-based HIV care model and in a mobile HIV treatment clinic; CAB members were interviewed on their needs and preferences in receiving care through community-based HIV care models as well as the role the CAB could play in developing and implementing mobile HIV treatment; CBO/ASO staff were interviewed about the needs of the patient populations they serve as well as opinions on models of community-based care that would be feasible and acceptable; hospital legal, compliance, and regulatory officials were interviewed about specific clinic and hospital regulations that would affect implementation of a mobile HIV clinic, including incorporation into the RWP; city officials were interviewed about regulations within the city that might affect implementation of a mobile HIV clinic; and existing mobile clinic program staff were interviewed about perceived best practices for implementation of mobile health clinics and past experiences carrying out mobile health care. Full in-depth interview guides can be found in Appendix A.

The research team debriefed interviews in weekly meetings and described new ideas that were brought up during interviews. Ideas that were brought up by participants multiple times were probed in later interviews. For example, participants described specific types of locations where they would prefer to access a mobile HIV treatment clinic, such as a grocery store parking lot, and these were probed in later interviews for opinions on acceptability.

Analysis and Data Management

All interviews were recorded and transcribed verbatim by the research team and a transcription service. Transcripts were quality-checked by a member of the research team to ensure the transcription was accurate and to de-identify any participant information. All interview recordings and transcripts were stored in HIPAA-compliant web base. One member of the research team ensured that all interviews were transcribed and reviewed the transcripts and

recordings again for errors. Role or position of each participant was preserved in the transcript file name in order to provide context during analysis and the presentation of results. However, in the results presented here, quotes from peer navigators were de-identified because the limited number of peers working at this clinic would have made their perspectives easily identifiable. Any quotes from peer navigators are included in the "Social Worker" category in order to preserve their confidentiality.

A qualitative interview codebook was developed by the research team. Deductive codes were developed from the interview guides with additional inductive codes developed from two patient interviews. The codebook was iteratively revised using three interviews from the provider and staff category, CAB category, and the hospital legal, compliance, and regulatory official category. Before full analysis, all discrepancies in codes between researchers were discussed until consensus was reached and a specific definition was agreed upon. Inductive codes were added as new themes emerged in analysis.

Qualitative data analysis was completed using MAXQDA Plus 20.0.4. Each interview was assigned two coders, one primary and one secondary, from a team of six researchers. After individual coding, the primary coder identified and discussed any discrepancies with the secondary coder until agreement was reached. Thematic analysis on coded interviews was completed to determine perspectives of a mobile HIV treatment model and implementation strategies to make mobile HIV care more acceptable, feasible, and safe.

Research Team and Training

The research team was made up of two principal investigators, four graduate research assistants (GRAs), and one undergraduate research assistant. Research assistants were chosen for their background and past experiences working with vulnerable populations, PLWH, and

communicating sensitive topics. All GRAs have a master's degree or were master's degree candidates. They all completed the Collaborative Institutional Training Institute (CITI) Basic/Refresher Course on Human Subjects Protection with a Social/Behavioral Focus. The four GRAs administered all surveys and conducted all in-depth interviews; they all have training in qualitative research methods through master's coursework. Preparing for the beginning of the study, one GRA held a practical training on qualitative interviewing for the rest of the GRA team. In addition, the research team discussed reflexivity in interviewing before the beginning of data collection.

Ethics and Safety

All study protocols were reviewed and approved by the Emory University Institutional Review Board and affiliated health system prior to their implementation. Informed consent was obtained from all study subjects prior to their participation.

Results

Participant Characteristics

A total of 36 in-depth interviews were conducted with key stakeholders, with an average interview time of 47 minutes (table 1). Among the key stakeholders, the research team interviewed: 14 Ryan White clinic providers and staff

Table 1: Participant Characteristics

	Number	Average Interview Time (minutes)	Roles
Ryan White Clinic Providers/Staff/Administrators	14	58	Physician, Nurse, Mental Health, Social Worker, Peer Navigator, Administrator
Community-Based Organizations providing HIV-related services	7	37	HIV Care, HIV Prevention and Awareness, Primary care inclusive of HIV care
Ryan White Clinic Community Advisory Board Members	6	52	--
Mobile Health Clinics	5	47	County health department, syringe exchange, HIV testing
Institutional and City Legal and Regulatory officials	4	40	Compliance officer, RWP manager, city attorney
Total	**36**	**47**	

(including physicians, nurses, mental health clinicians, social workers, peer navigators, and clinic administrators), seven staff members from CBO/ASOs that provide HIV care and support services (including HIV prevention and awareness, primary care inclusive of HIV care, substance abuse counseling and support, nutritional services, and mental health support for PLWH), six CAB members, five staff from organizations operating mobile health clinics (including a county health department mobile clinic focusing on HIV and STI prevention and testing, an HIV testing van facilitated by a CBO, a syringe exchange and linkage to care mobile clinic operated by a private university, and an international mobile HIV treatment clinic), and four institutional and city legal and regulatory officials (including a hospital compliance officer, Ryan White Program manager, and city attorney). Through the in-depth interviews, the justification and advantages of mobile HIV clinics (MHCs) as well as barriers and facilitators to implementation of an effective MHC model emerged.

Justification and Advantages of Mobile HIV Clinics

Participants described key advantages to the use of MHCs for provision of HIV care, which we organized thematically into patient-level, clinic-level, and environment-level advantages below and in Table 2. While we recognize there is overlap between categories, we

Table 2: Justification and Advantages of Mobile HIV Clinics

Patient	**Convenience** – time and location *makes reengagement and retention easier* by saving time and decreasing financial barriers quicker for patients than going to the clinic, better for patient's busy schedules; would strengthen HIV care, cut down on transportation issues; location easier to get to and thus decreases financial barriers; can create gateway into coming back into HIV care in the clinic
	Perceived effectiveness for those with social and functional barriers – transportation issues, housing insecurity, physical disabilities, other medical issues, and those that stop coming because they feel healthy because of the convenience
	Confidentiality of not having to go into the hospital
	Reducing shame of falling out of care that prevents reengagement
Clinic	**Greater community reach** – can capture patients in different pockets/neighborhoods where clinic traditionally wouldn't be; going to community center, CBO, shelter; can capture more patients by moving
	Ability to provide **more care options** for those that have fallen out of traditional models
	Increased **ability to provide patient-centered care** - meeting patients where they are at demonstrates that the clinic cares; can provide services they want/need to stay in care besides HIV
	Opportunity for clinic to **engage in different, more meaningful way** – increase patient trust in clinic and providers
	Potential for clinic and providers to **understand additional barriers** patients face by seeing them in their community
Environmental	**Greater potential to partner** with city, community organizations, those that provide testing services
	Could **decrease community-level stigma by reframing care** – positive messaging, destigmatizing hashtag/events

reached consensus that the subthemes fit best under the respective headings below which they are placed.

Patient-level advantages

Participants described key individual patient-level advantages of Mobile HIV clinics, including: increased convenience, perceived effectiveness for patients with functional, social, and other barriers to care, confidentiality benefits, and reducing patients' feeling of shame of falling out of care.

Convenience

By not being constrained to one physical location or normal clinic hours, MHCs will make HIV services more convenient to patients—saving time, decreasing transportation costs, and making re-engagement and retention easier by providing more accessible locations to travel to for care. This convenience is thought to strengthen HIV care services and provide care that can better fit into patients' busy schedules and lives. Convenience is perceived to address barriers to re-engagement and retention such as inaccessible location and travel time and costs, and therefore, can create a gateway to coming back into care for PLWH who have fallen out of care. Convenience was also mentioned as an advantage for re-engaging PLWH who have fallen out of care because they perceived HIV care as a low priority since they felt healthy.

> *"You can say, knock on that door and say 'we're right down the street, we're right here, you don't even have to put on outside clothes, come in your pajamas you know we're right here' … at least we're making it a little bit easier to get the care that he needs. So I think it could have a lasting impact on his health and the community, so I think it's definitely the way to go." -Nursing staff*

> *"They [the patients] have to get on MARTA, go on a bus, do they have money for that? You know there are a lot of things that come into play. Uh so I like the [idea] of a mobile clinic that comes to them. I think that that would work in keeping people in care." -CAB member*

Perceived effectiveness for those with social and functional barriers

Participants expressed that MHCs will be effective at providing HIV care for those with social and functional barriers, including lack of reliable transportation, housing insecurity, physical disabilities and other medical issues. Effectiveness was mentioned both for individuals with these functional barriers (i.e. homelessness) and those that may have recently overcome functional barriers but have not yet re-engaged in HIV care. PLWH with competing priorities such as social and functional barriers could benefit from a cue to action that an MHC can provide, in order to re-engage in care.

> *"Our patients that have problems with you know homelessness, home insecurity, you know difficult sometimes our patients even have like physical difficulties, they have a MARTA card but they have horrible neuropathic pain in their feet, so being able to like walk a block, rather than walking all the way to MARTA, getting off of MARTA, trying to make your way into the hospital, I think it's, it's [the mobile HIV clinic is] helpful […] Actually, I think this would be really good, not just in um our treatment insecure patients but those with kind of some physical disabilities." -Healthcare provider*

> *"I think they would love it. I mean I'm trying to put myself in a situation and say you know what, I know this is probably it. Things happen, I'm homeless now, that's the reason why I can't come back, but now that I'm living with my aunt, I really don't want my aunt to know that I have this, so just forget it, I've been doing well all this time. Then I see this big truck pull out and it says oh free testing, or free treatment, and all that, I'm gonna inquire, 'look I know I'm positive, haven't been on treatment, can you help?' I would do that, I really would." -Nursing staff*

<u>Confidentiality</u>

The ability to provide confidential HIV care services within communities was seen as a potential advantage of the model. (It was also noted as a potential barrier to an effective MHC model, discussed further in section "Key Considerations to an effective Mobile HIV Clinic: Barriers and Facilitators" below):

> *"I think it is, provides a level of confidentiality for the clients. If you're testing off site to be able to test in the neighborhood, it's comforting to know that we got this space by ourselves. I can get my status in a secured, confident spot […] it does provide a level of security because you're inside a closed environment. And it's*

> *comforting to know just, you know that you could step on a bus or a van, receive your, your status and/or treatment, or treatment. Like I can really go and get treatment, I don't actually have to go to the doctor or downtown." -CBO staff member, HIV prevention and awareness*

Reducing shame

An MHC model could also facilitate re-engagement by reducing possible shame patients may feel when they fall out of care, which prevents them from seeking care again. Participants expressed that by coming to the patient, it sends a powerful message that the clinic cares and truly wants them to come back in care. Providers expressed that they believe sometimes patients feel shame when they fall out of care and this message can help overcome this feeling and facilitate re-engagement.

> *"I get this sense that one reason they stay away is because they have this sort of shame around, this this feeling that I didn't do what I was supposed to do and so it's not that they don't even want to come back, they somehow feel like I've let you down in some way and so I think going to them um just communicates that it doesn't matter what's going on for you, I am there for you" -Mental health clinician*

Clinic-level advantages

Participants also described clinic-level advantages to delivering care in an MHC model, including: greater community reach, ability to provide more care options, increased ability to provide patient-centered care, the opportunity for the clinic to engage in a different and more meaningful way, and potential for the clinic and providers to understand additional barriers that patients face.

Greater community reach

With the ability to move HIV care services out of a fixed clinic and travel to different locations, participants expressed this would help capture more patients in a variety of neighborhoods and areas where the clinic traditionally would not be. The ability to travel to community centers, CBOs, shelters, or other community organizations

could increase the reach of the clinic and ease of access for patients. By being directly placed in communities, it can act as a visual reminder to come back into care as well.

> *"Because you could go anywhere. If it's large like this you have to set up at a grocery store. But if it's a smaller uh testing unit, you can go into the hood. You can go into these little pockets where people only come out at night. You know what I'm sayin', you can go to places where you wouldn't traditionally be, a park, anywhere, you know a community event where this would be acceptable." -CBO staff member, HIV prevention and awareness*

> *"And it's also kind of a visual reminder as well. I think a lot of people just driving past be like, 'Oh, maybe I should stop in.' Even if it wasn't on their mind, even though they hadn't seen all of the internal communication, but just it being present out in the community instead of kind of, I guess, at the hospital off at a distance. It's like right there in the middle of everything." -CBO staff, Nutritional services for PLWH*

> *"But I think the van would um probably reach the largest group of people." -CBO staff member, AIDS service and advocacy*

Ability to provide more care options

Participants expressed that MHCs will be beneficial to retention by simply providing more care options for PLWH who have fallen out of traditional HIV care. By offering more options to patients, they are more likely to be offered an option that will work for them.

> *"I think the more we can give 'em, the more likely it is to retain them and have them continue to come back. Um, ummm but just if we only provide one service, they may say well I mean, I don't, what are they gonna give me, what am I gonna get from going, it's nothing different." -Nursing staff*

> *"I hope this mobile care unit comes into effect because I think it will help a lot of people who just don't want, I don't want to come to the hospital, I don't want to come to the doctor's office. You know, I think it will help to keep people in care because you know we need that, we absolutely need it." -CAB member*

Ability to provide patient-centered care

One major advantage to an MHC is the ability of the clinic to provide more patient-centered care. As one participant described:

> *"Cause again that's like I mean that is synonymous with patient-centered care right? Like going to - that's literally meeting people where they are." -Mental health clinician*

To participants, more patient-centered care would demonstrate that the clinic cares, with positive effects on re-engagement and retention because of this.

> *"Because you're coming to me. I don't have to always come to you, especially if I have an option […] It demonstrates to me that you're, that you care about me and my wellbeing." -CAB member*

In addition, the services offered on an MHC can be catered towards patient needs in a way that a traditional clinic cannot by providing key services such as mental health counseling, medication adherence, or labs in a way that is accessible to them. The ability to partner with community-based organizations will further expand the patient-centered services the clinic can provide, such as nutrition services or food resources, housing assistance, or non-HIV medical services.

Opportunity to engage in a "different" and "more meaningful way"

Participants discussed that bringing HIV care into the community allows the clinic to engage with patients and the wider community in a different and more meaningful way. They described that a more frequent presence in the community could increase trust and familiarity as patients see the clinic outreach beyond traditional clinical care. This outreach within the community could promote trust by showing patients that the clinic is interested in understanding their lives and experiences in a new way. The maintenance of personal contact also communicates the clinic's belief in the extreme importance of health, something that may help patients understand the importance of HIV care and motivate them to remain in care.

> *"I think it provides an opportunity for the clinic to engage in a different way. Sort of maybe even a more meaningful way in patients that we see because we sort of hear um stories of when you're, when you're able to sort of experience the lived experience of others." -Mental health clinician*

> *"I think an advantage over the telemedicine would be that it does maintain that personal contact… Especially with some of our clients, people who are isolated.*

> *Some of the people at clinic as well, being isolated from their families. I think that personal contact is still very important. So I see that being an advantage, them still coming directly to you face to face kind of thing… and when something is as important as health care, making it more personal, I think, really shows — I guess in some ways shows the gravity. Your health is important. Taking care of yourself is important. There is somebody who cares about you. And I think it just gives more of an opportunity for that person to feel loved and for them to also, again, realizing the gravity, and really taking that initiative, and being motivated to take care of themselves. I just feel like there's so many reasons why we really need to stay connected to one another." -CBO staff, Nutritional services for PLWH*

Potential to understand additional barriers

Besides increasing trust, delivering care in the community rather than a traditional clinic setting provides an avenue for providers to understand additional barriers to care their patients face, that they would not have known about. This can improve the quality of care and services the clinic can provide to PLWH.

> *"Like other kinds of barriers that are um impacting patients that we just don't have an awareness of be-because we're not there um so it gives I think an opportunity to improve treatment delivery um in ways that we haven't just, that we just haven't considered." -Mental health clinician*

One nurse discussed her prior experience working on an MHC. She highlighted the ability of MHCs to provide opportunities to uncover elements of medical care that often went undiscovered in high-volume clinic settings.

> *"I mean every time we went, it was amazing, 'cause you were finding something else that would have been lost because even in patient care, usually doctors see 120 patients or something, something's gonna be missed… So and when I saw the HIV mobile it just reminded me of that and I'm saying. Those are kind of like, we're gonna clean up and sweep up the rest of the stuff that got you know probably left behind." -Nursing staff*

Environmental-level advantages

Participants expressed that at the environmental level, an MHC model provides a greater potential to partner with outside organizations and a potential to decrease stigma by reframing HIV care.

Greater potential to partner

MHCs presence within the community creates a greater potential for the clinic to partner with local government, community organizations, and other HIV-related services such as HIV testing. Partnering has benefits including an increased ability to provide more comprehensive care for PLWH, increased trust within the community, and providing care beyond traditional clinic offerings.

> *"You know, there's so many people who bring care into the community and they're just so subtle. A lot of the churches that have um night shelters, you know, they might be willing to be involved, whether it's giving you guidance on what medical care they see people need, you know, having a clothes closet is always great for people to get into something, as well as basic food." -CBO staff member, AIDS service and advocacy*

> *"We could also be a part of that one stop shop if that was a part of it. And, or then bringing food. We're also piloting some grab and go meal type of stuff. And so I think there's a lot of ways where this actually matches up really nicely with both of our missions, because we're already working on telenutrition. And so that sounds really exciting… Bring food and snacks. People will come." -CBO staff, Nutritional services for PLWH*

Decreasing community-level stigma

While the potential barriers that stigma presents are mentioned in the next section, some participants expressed their belief that MHC models had the possibility of decreasing community-level stigma associated with HIV by reframing what HIV care looks like and how it is presented.

> *"Make it more comfortable, and I feel like like, you know, more frequent presence in the community, you know, become more familiarized with us. So, that kind of stigma, you know, the stigma is reduced." -Mobile unit staff member, Health Department*

> *"And then and, and I think while it can be stigmatizing there, there might also be an opportunity to decrease stigma. Maybe the bus becomes a cool place you know maybe that's the party bus you know maybe there's a way to reframe what it means to-to live with HIV in a way… So, so I think the approach would be not just delivering HIV treatment but maybe there's on the day the bus comes there's a farmer's market or there's a block party … you know what I mean so it's not just*

associated with something that people um might necessarily go to gloom and doom." -Mental health clinician

"Yeah. Part of me worries about the stigma, but part of me also wants to just be out and about. To like, decrease the stigma of it … I think that there's benefit in people seeing that like we are coming out; our clinic is coming out" -Healthcare provider

Key considerations to an effective Mobile HIV Clinic: Barriers and Associated Facilitators

Participants described potential barriers to an MHC that, if not addressed, would decrease the effectiveness of the model as an alternative care option for PLWH who are out of care (table 3). However, participants also described ways these potential barriers could be addressed in the design and implementation of an MHC model, described here as facilitators. Potential barriers were organized thematically into patient-level, clinic-level, and environment-level barriers below. The related facilitators are described alongside each potential barrier. While we recognize there is overlap between categories, we reached consensus that the subthemes fit best under the respective headings below which they are placed.

Table 3: Barriers to an effective Mobile HIV Clinic model

Level	Barriers
Individual	**Confidentiality and Stigma**
	Patients' lack of physical and emotional comfort with the model (affected by potential stigma)
	Hesitancy to trust new clinic/new providers (unfamiliarity or bad exp. with testing vans)
	Accessibility concerns of different locations (and parking availability)
	Potential that patients will fall out of other necessary medical care
	Decreasing patients' responsibility and self-efficacy in their care (seen as enabling; sends message it is always the clinic's job to track them down)
Clinic	**Potential high cost** (start-up cost, variable use, cost-effectiveness for # of pts)
	Limited capacity (# patients, service limits, scheduling limits)
	Ability to adhere to privacy/confidentiality policies and practices
	Safety concerns (target for theft for equipment, medications, and prescription pads; target for stigma-related hate; possible irate patients; safety concerns affected by location and community acceptance)
	Staffing/time limitations
	Ability to handle urgent/emergency situations
	Adequate awareness of the MHC among the target population (reaching them and being able to communicate about the model in an appropriate, acceptable way)
	Potential lack of HIV care provision of equal quality to clinic setting
	Fragmentation of existing patient-provider relationships and discontinuity of care
Environmental	**Community acceptance and safety** (permissions to park, generator noises, effects of potential stigma connected to MHC)

Patient-level barriers and related facilitators

At a patient-level, participants described barriers to an effective MHC model that include: confidentiality and stigma concerns, patients' lack of physical and emotional comfort with the model, hesitancy to trust a new clinic with possible new providers, accessibility concerns, the potential that patients will fall out of other necessary medical care, and decreasing patients' responsibility and self-efficacy in their care. Facilitators to address these patient-level barriers also emerged and are described in relation to the respective barrier they address.

Confidentiality and stigma concerns

Given the persistent stigma associated with HIV, the potential for MHCs to breach patient confidentiality (i.e. through the outside appearance of the van, location, and services provided identifying patients as HIV-positive) was a concern brought up by almost every participant.

> *"You know, I just wonder just with the stigma. I used to do homeless outreach over there, so you pulling up and the folks know that you're doing outreach and you have, like, you know, a backpack with, like, gloves, and a sandwich and you'll talk to them and stuff, there's no stigma there, but when an HIV treatment center van pulls up, you know, again, a lot of my stuff goes back to stigma and people being comfortable and they're safe." -CBO staff, Nutritional services for PLWH*

> *"But when you put the van in the community, I just know that people, that the ones that's really struggling don't want to be seen or associated with going to a big van in the community where they stay at […] because even the ones that come here they don't come here brimming with 'I'm positive and I'm going to care.' It's a gradual thing before they really buy into that." -CBO staff member, HIV prevention, substance abuse counseling, and support*

> *"I think I've always struggled with that only because say this was blue and this comes into say certain neighborhoods at certain times. People talk, so especially if there's incentives or whatever the case would be. So, people would probably feel a certain way in their neighborhoods walking into there. Because everyone knows the blue bus is the HIV bus… [even if it doesn't say anything on it…. yeah community talks… And after a while they'd be like I'm not going over there and it depends I think where it's located." -Social Worker*

While stigma and confidentiality were described as major concerns, participants also described numerous facilitators to reduce associated stigma and protect confidentiality of patients including, providing additional non-HIV services such as blood pressure testing, basic health screenings, and health education resources so that patients could be accessing the clinic for any number of reasons, designing an appropriate outside appearance of the clinic to maintain confidentiality, locating the clinic in "busy areas" where it will blend in to the community rather than stand out, scheduling appointments in order to limit the number of patients on the van at one time, and an inside layout that ensures privacy.

> *"Because you know what I mean, no matter how you design it, after a while it's that's the HIV bus… But if they could like, if it's on the side of a strip mall and everybody's moving. You know how now people so busy they go about their day." -Social Worker*

> *"I think it should be HIV slash like Diabetes slash something else so that nobody knows why you're going in there. Who cares cause it's just any other clinic." - Nursing staff*

> *"Ideally, the van would even, would have some kind of aspect to it that wouldn't make it feel HIV specific… because reducing - because the stigma issue and privacy. I guess it could be a HIPAA issue." -CBO staff member, AIDS service and advocacy*

> *"I think it could be a rotating schedule where you have like, 'This is a primary care day. This is a mental health day. This is a nutrition day.'" -CBO staff member, Nutritional services for PLWH*

> *"I do think it would destigmatize it if it wasn't just HIV. I mean, there's always the stigma, because it's about sex. Like it's a sexually transmitted infection or, PrEP, so I think it's hard to completely avoid it… I think that those barriers, when I think about stigma, privacy – I think it can be overcome in ways." - Healthcare provider*

<u>Lack of physical and emotional comfort</u>

Participants also raised concerns regarding patients' physical and emotional comfort with an MHC. Participants described that patients' comfort was dependent on their perception of the amount of stigma associated with and confidentiality maintained by the model, but also included concerns about whether patients would feel welcome when accessing the MHC, whether they would feel comfortable in the waiting area of the MHC, and comfort with the physical location of the MHC. Additional facilitators to physical and emotional comfort include, an outside appearance that is welcoming and inviting, providing a comfortable waiting area with small amenities such as water, snacks, air conditioning, and phone chargers, culturally competent and caring staff, and having a frequent presence in the community.

> *"So I feel like spruce it up with some warm colors, and comfortable seats, and things like that. I think they matter, and it feels better than a waiting room […] Because I feel like that could also be part of it, is just some people hate hospitals. And just making the care more comfortable, more approachable, less health care-ish." -CBO staff member, Nutritional services for PLWH*

> *"And be able to not only on the inside but approaching on the outside that the client doesn't feel offended and is comfortable and at ease. Because you know how, um if you happy to see somebody, so as you're coming towards them that anxiety wears down. So the anxiety will come in first letting you go out the visual of the mobile unit first. -CAB member*

<u>Hesitancy to trust a new clinic and new providers</u>

Participants expressed the potential that patients would be hesitant to trust an MHC model because of the unfamiliarity with receiving HIV care and services in a mobile setting, possible past negative experiences with HIV testing vans, and potentially new and unfamiliar service providers operating the van.

> *"The first challenge for people being comfortable. For getting to know who you are. Once they're comfortable and they know that you're out there for that particular care, and you're going to be out there on an ongoing basis, then I think*

> *it will get easier. But in the beginning, it's going to be a little challenging." -CAB member*
>
> *"Maybe just because it's new, right? Just getting people to say, oh, wait, we are doing this in a van? Like, what are we doing? Because the last time somebody pulled up in a van, they were giving me $25 for a survey, right? So just trusting, like, hey, we actually work for [healthcare institution]. We actually do this and this and this. You can actually have a real appointment here if you want to, right?" -Social Worker*
>
> *"Cons would be, who are these people? Uh does it feel like I'm receiving care from a stranger?" -CBO staff member, HIV prevention and awareness*

However, participants also expressed that trust in the MHC model would be facilitated by communicating the model through providers and peer navigators, the trust in the larger healthcare institution, time, word of mouth, and providing quality care and services.

> *"But I think also [healthcare institution] is a trusted brand. I mean, everyone knows the logo, everyone knows the name. It's Atlanta. Like, you're trusted to be like a powerful entity in the city of Atlanta with regards to healthcare that's able to do things maybe other places aren't… [healthcare institution] is a trusted name in healthcare, but also HIV care." -CBO staff member, HIV mental health support*
>
> *"So um that would help I think and I think patients once they see what it can offer will really put the word out ourselves. So if we make it the best that it can possibly be and really put our best foot forward then our patients will be our best our advocates for it and keep it going." -Nursing staff*

Accessibility concerns

The accessibility of the van, including location and parking availability will impact the effectiveness of the MHC model for re-engagement and retention. Participants expressed that the location should ensure accessibility for patients in order to reach the potential convenience advantage of MHCs.

> *"Um it depends on what the, where the, the van is parked, I believe, because like, if you guys are parked near MARTA [public transportation system], that'd be good, right? But if you're parked in the city, how are my, how are they gonna get to you? You don't wanna put another barrier on it. Close to MARTA is good." -Social Worker*

> *"So, I know my patients are just like, bro, I spent all day try'na find parking. That should definitely not be a barrier with this clinic. They should definitely have a place to park, and it should be free, and it should be like easy access. Yeah, that's, that's another one […] Preferably, if MARTA is near it, also awesome, 'cause then my patients could just take the MARTA and get off, you know what I mean? And then we need to be able to provide them MARTA to get home." -Social Worker*

> *"And then also how to target — How are you going to target specific areas if, because Atlanta is so spread out, and I think our population is also kind of spread out. And though there might be some hotspots across Atlanta, I guess, how to be able to reach everyone that might need." -CBO staff member, Nutritional services for PLWH*

Potential of falling out of other medical care

Participants expressed concern that in offering mobile HIV care within patients' communities, there is a risk that they will fall out of other necessary medical care which requires them to travel to traditional clinics. If they receive HIV care closer to where they live, they may be less inclined to seek out other medical care that is not as convenient. To mitigate this, many participants expressed that an MHC should integrate into other aspects of health care delivery, and the potential risks if it is not.

> *"You know, like, homeless folks have like, a lot of co-occurring health issues, so it would have to be integrated." -CBO staff member, HIV care*

> *"Many patients that we see have sort of multiple medical needs, so you know if they sort of need to sort of see a specialist would they be less inclined to then go someplace else to get their [other treatments]" -Mental health clinician*

Decreasing patients' responsibility and self-efficacy in their care

Bringing HIV care and services to patients might have the unintended effect of "enabling" them or sending the message that the clinic believes they are incapable of coming into care, disempowering them. It will decrease patients' responsibility for their care and reinforce the idea that it is always the clinics' responsibility to track patients down and keep them in care.

> *"I don't want our patients to kind of feel like it is our responsibility always to kind of chase them down, like I don't want to kind of limit their growth, cause I'm just like when you become a grown man and you have a job and you have it together, like life is not always gonna meet you where it's most convenient so I, sometimes I kind of worry, not that we're enabling cause I don't want to use that term… but that we're… not giving patients a chance to kind of get it together." -Healthcare provider*

> *"Yeah I think it might create this sense for patients um that...that the provider is sort of always available to them. It might make them less inclined to um...be active in their care. Um it might sort of reinforce the notion that you...like if I use the example of the patient with depression um that while this could be used for a person with depression then there might be a message too that's sent where when a patient coming to the appointment is actually something that um makes them feel better, and so it may sort of lose that opportunity to sort of process that with the patient because the notion might be you, the unwitting message that might be sent to the patient is 'you are incapable of coming in right so, so you're fragile so we need to um, we need to make sure you don't leave and that we sort of attend to you in this way.'" -Mental health clinician*

Some participants suggested that an MHC could be used successfully as a gateway to re-engagement with the goal of getting the patient back into long-term care at a traditional clinic. An MHC would serve as an interim solution for patients because it presents fewer barriers to re-engagement, and subsequently the clinic and health care providers can provide support services to bring them back to regular HIV care.

> *"Yeah, we're gonna be with you for a while, we're gonna get you up on on your feet and then, you need to come to [the regular clinic]… I want to kind of strengthen our people and give them kind of the tools…over a period of time and then you come on back here." -Healthcare provider*

Clinic-level barriers and related facilitators

Clinic-level barriers also emerged that would hinder the ability of the clinic to be able to implement this model as an effective alternative HIV care option. These barriers include: potential high cost, limited capacity, ability to adhere to privacy and confidentiality policies and practices, safety concerns, staffing and time limitations, ability to handle urgent and emergency situations, adequate awareness of the MHC among the target population, potential lack of HIV

care provision of equal quality to the clinic setting, and fragmentation of existing patient-provider relationships and discontinuity of care. Facilitators to address these clinic-level barriers are also described here.

Potential high cost

Although participants did not know the specific costs of implementing an MHC model, they expressed concern over the cost-effectiveness and cost per patient of this method of service delivery. Factors that influenced cost concerns were potential high start-up costs, variable usage of a mobile unit if patients did not show up to appointments, and the limited capacity of mobile units to treat only a few patients at a time. Some expressed the opinion that it could be a bad steward of providers' time and clinic money if there are a lot of resources devoted to a few hard-to-reach patients.

> *"Are we looking for ten people to be on the mobile clinic and we only have five today? Is that still a successful thing? So, we have to have that conversation. I guess [clinic staff] will have to have discussion what is the cost benefit factor? Because that will be a question that I will have as well after looking at all your data." -Compliance official*

> *"But I can't even imagine having the resources to run the clinic, and also, have somebody going to these places enough and as frequently – and frequently enough to gain trust in the community and also to give folks the ability to actually take medication on a daily basis, is what it comes down to for a lot of folks." -CBO staff member, HIV care*

> *"I guess also like not knowing if you're gonna have, you don't have a set schedule, you don't know if today you're gonna see 0 patients or you're gonna see 10 patients… Could you be influxed with you know a large crowd at one time and can't service them or will you see ab- you know just spend the whole day driving around to 3 different spots and you don't get anybody um so is that seemed, is it really a good steward of people's time and money if we're not if we're not meeting, if we're not having any patients." -Nursing staff*

> *"I think time-wise when we talk about it, like we've already discussed, you could have a set schedule where they could come in and drop in um but if you don't have a schedule I think you, that again is something where like I was saying, like there could be days where you have no one and it's not a very good um steward of*

> *time or money. Um so, that would be something to look into. But I think it can be overcome with a schedule." -Nursing staff*

However, some participants thought it would be cost-effective. Solutions that were offered to make it more cost-effective were scheduling appointments so that the possibility of being underutilized and risk of variable usage is mitigated.

> *"I mean honestly, it seems cheaper, more cost effective than having a brick and mortar." -CBO staff, Nutritional services for PLWH*

Limited capacity

While there are concerns of low utilization, there is also a concern among participants of the limited capacity of an MHC model. Space constraints limit the capacity of an MHC model in terms of providers and services available and number of patients that can be seen. This could limit the cost-effectiveness of the model, scope of supportive services that can be provided, and create confidentiality concerns in a smaller space.

> *"I think the only thing, or one of the only things, is just how can you get all of the health care team, all the essential pieces into a little van. I don't know if there would be a model, and this might be thinking way too far outside the box, but having a model instead of just a van, but doing a trailer, dropping off a trailer for, say, a month, and then having more space for these services, and then the next month being in another location and only kind of serving two to three miles radius every month." -CBO staff, Nutritional services for PLWH*

> *"Mobile units are big, but they're typically small. So you could test one to two people, or give one to two people care at once, and that's not a lot; while here we have about 10 exam rooms, so we can get people in and out. But with a mobile unit there would be one to three." -Social Worker*

To address the limited physical capacity of MHCs, participants made suggestions for the most important HIV and non-HIV services that should be available on a MHC van (i.e. telemedicine could be used to link services that could not physically on the van such as mental health; strong system of referrals and integration into the larger health care system).

Ability to adhere to privacy and confidentiality policies and practices

Maintaining confidentiality while delivering mobile HIV care is more difficult because of the location within the community and potential for other community members to see patients accessing the van and compromising their confidentiality. The limited space inside an MHC van presents confidentiality concerns when multiple patients are accessing the van at once, affecting the potential comfortability of patients in receiving HIV care this way. Participants expressed a need for private spaces within the van, a waiting area that is comfortable and mitigates privacy concerns, the possibility of a second exit so that one-way flow through the clinic limits patient contact, scheduling appointments to limit the number of patients on the van at one time, scheduling appointments during "busy" times of the day and in "busy" locations, offering and advertising non-HIV services on the van, an outside appearance that could protect the confidentiality of patients' HIV status, utilizing electronic records and encryption, and plans for deterring curious community members that ask about the purposes of the van.

> *"Ideally, the van would even, would have some kind of aspect to it that wouldn't make it feel HIV specific… because reducing - because the stigma issue and privacy. I guess it could be a HIPAA issue." -CBO staff, AIDS service and advocacy*

> *"You need some kind of privacy space. Golly, I don't know. I guess I'm picturing almost something more like a small road elephant. You know, you need to be able to stand up in it. Um people would need privacy. You need to be able to draw blood. You'd need a place for people to wait where they're not in the rain or the blinding sun so at least it would need to be big enough to have privacy. Man, I wonder, the specifics get a little challenging 'cause thinking about the need to have water and soap, that kind of thing, and a waiting area." -CBO staff, AIDS service and advocacy*

> *"So, if it's near a store where people walk in and out. They could see someone coming in and out. I think it would have to be located some kind of way differently. I think if it's in a generic area that blends in… Not on the street, but like a strip mall but over to the side where people are not, it's not where you'd just see it. It kind of blends in with what's going on in that neighborhood. And so,*

> *I think with that way you could generally pull people, maybe not in that neighborhood but close to it." -Social Worker*

Safety concerns

Participants expressed concern for the safety of providers, patients, and supplies on an MHC. An MHC could be a target for theft of equipment, medications, and prescription pads, and for stigma-related violence if the van is associated with HIV care. Participants expressed that safety concerns were affected by the locations the van operated in as well as community acceptance.

> *"Safety is important for me and these are a lot of the kind of questions that I would like to know, where are we, where are we going? How long are we gonna be there? Who's gonna drive this?" -Healthcare provider*

> *"What would you do about security? Um, there's you know, there's, there's a lot of um hateful people and you know, so you know those are some concerns I have. Um, you know I, I, I'd hate for a mobile clinic - I'd hate for any clinic to be a target of uh of you know any kind of violence or hatred" -CAB member*

Participants described key actions to facilitate safety in the design and implementation of a MHC model: working with police to determine appropriate locations as well as exit plans from an area, notifying police of the schedule, providing staff and providers with safety training, adding security personnel or utilizing the driver as security personnel, limiting the medications on the vehicle, and installing a lockbox, panic button, camera, and signage that facilitates safety.

> *"The safety thing, it's just a matter of access. Other than people having the misperception that it contains something that it doesn't but that's easily fixed by just saying, you know, like ... disclaimer out there. There's nothing on here, maybe a computer but yeah, just making its known. No medications, no narcotics, nothing of that nature is here. I don't know. You may always have somebody who just does not believe your sign. In that case, other than locks, a camera. Of course, somebody will always know the route, places they're scheduled to be. They can always check in. I don't know how realistic it would be to take some sort of security with you." -Nursing staff*

> *"So, the – having medications on the van, we kind of make sure we keep it safe and locked up and in a temperature-controlled environment. As far as being in*

> *areas where it might not be considered safe, we try to make sure when we're planning, because a lot of planning goes into before we go out anywhere, so we just try to make sure that we put ourselves in places that are, you know, well-lit; places that you know, that they think that it might not be safe at all, then we wouldn't go there. But we definitely, if we need, to work with the [police department] … we definitely let them know ahead of time, so that they could be there on the, you know, on the scene if we need anything. But no, we definitely feel safe. And, I mean, we definitely are in visible areas. So, we always – because we want to make sure people see us from the street when we're driving past, in case they want to come and meet us and things. So, we're always in an area that's, you know, out in the open, and around others." -Mobile Unit staff member, Health Department*

Staffing and time limitations

Participants expressed concern over the time and personnel limitations if an MHC model is staffed by existing clinic staff and providers. Some participants suggested utilizing advanced practice providers such as nurse practitioners and physician assistants in order to preserve physicians' limited time.

> *"The providers. Like, who goes there? Like, I mean, you know, I always think about it because of my own job here – it's very split and you know, time is apportioned in a certain amount of way, and it's not like I can just, you know, for example with my schedule, I can't just go on a mobile clinic. But you know, is it – would it be understood that okay, if you're a provider here, it's your responsibility once a quarter to go, instead of one of your clinic slots, go to – it's like – so, would it be like in place of a half-day of clinic, I'd go on the mobile van? Or, am I going to be asked to do it in addition to my clinic slots, which would be very difficult for me to do personally. Probably the same with everyone. So, how would that get done with our own workflow? Especially if it's like [a healthcare institute infectious diseases] van… Yeah. And you know, you may not need to have more than one provider there. But you know, if it's like an advanced practitioner or nurse practitioner like, or are you just available via phone, or something like that. So, just like, what that would look like for providers. And their responsibility and expectations." -Healthcare provider*

Ability to handle urgent and emergency situations

An MHC model must be equipped to handle all urgent and emergency situations, from irate patients to emergency medical concerns. Participants stressed that this should include appropriate protocols, appropriate equipment, and adequate number of personnel to handle

emergency situations. They also expressed that integration into the existing health care system would aid in maintaining continuity of care during urgent medical situations.

> *"It's like alright, um… somebody falls on the floor, they're half dead, who's gonna help the doctor?" -Nursing staff*

> *"Um you would definitely have to have somebody that is equipped on there as far as if there's an episode whether it's a security episode or whether it's a health episode. Have to have somebody that definitely um can help in that situation. So if you have somebody that's irate, you definitely need somebody there whose gonna say look this is not tolerated. Because a doctor and a patient on a bus and them saying go somewhere is not gonna work… So whether its a security type of person, security just to stay there for as long as it's there, doesn't have to be a cop, but as long as they look intimidating and can you know 'hey, behave I see you'" -Nursing staff*

<u>Adequate awareness of the MHC among the target population</u>

If the goal of the MHC model is to re-engage PLWH who are out of care, the clinic will have the same initial challenges reaching this population to communicate this alternative care option as they would to communicate about coming into their fixed clinic. Disconnected communication between patients and providers (because phone numbers are cut off and alternative means of communication are lacking) is one barrier to re-engagement, no matter the specific strategy. If there is not adequate awareness of the MHC among the target population of patients, the model will be underutilized and thus ineffective. Additionally, participants expressed concern of being able to "market" and communicate about the model to PLWH without targeting them or exposing the model as an HIV-specific van that could increase the potential as a target for stigma and breach of confidentiality.

> *"I mean it's a wonderful idea but I believe there's going to have to be a great deal of effort on the part of the clinic staff to make patients aware and to truly make them aware and to not say we tried to make them aware to do those things that you know for sure you know they are aware because I even doubt if most people here with all the patients they have they actually know or have actually seen where these patients live… In my mind I just honestly believe that people should*

> *just drive and literally go and locate where people say they are living." -Nursing staff*

Participants noted ways to facilitate awareness of the model: through enthusiasm and supportive communication about the MHC option to patients in the fixed clinic before they fall out of care, communication about this option during clinic orientation, through peer navigators that go into the community to reach patients who have fallen out of care, through flyers in the fixed clinic, and through word of mouth and visual reminders (i.e. the clinic being seen out in the community or parked near shelters or other places patients may access). They emphasized communicating in a way that would not further target the van for stigma, and to communicate in a caring, supportive way.

<u>Potential lack of HIV care provision of equal quality to the clinic setting</u>

Some expressed concern around the potential of the HIV care provided on an MHC to be of lower quality than a fixed HIV clinic. For some participants, care at an MHC was seen as "microwave" care, patients should not expect that it can provide everything that the usual clinic can. Other participants felt that all services that are provided at the fixed clinic should be available in an MHC model. Use of the MHC as a re-engagement tool with linkage and integration into the health care system rather than for long term retention was suggested by participants to overcome potential service limitations associated with MHCs.

> *"Substance use… social services… social workers, nutritionists, you know pretty much the same um peer navigators, I think behavioral health or even if those assessments could be initiated there [at the mobile clinic] um and then because you know that it may or may not be feasible to sort of have service delivery happen there but certainly sort of assessments in that way with the physician, nurses." -Mental health clinician*

> *"I think the same services we provide here [at the regular clinic]. I think that the same services that we provide in terms of like the care that we provide. I think the care should be measurable, comparable. They should be the same, you know what I mean? I, I shouldn't be like, Dang, this? I gotta go in this van, it's broken down,*

> *you know? Or I could go to a, the clinic and it's you know. It should, it should be the same. It should be the same look, feel." -Social Worker*

> *"But I think there's a stigma about being poor, and like getting crappy resources for everything. And I feel like that, the way public health often looks is like look, we're not going to give you anything, except we're going to control this epidemic, right? And you're part of our public health approach to ending this epidemic. So, like, we know that you don't have shit, but we're going to drive up on your like, territory, and… Like we're coming in temporarily, we're giving you this one minute thing that we're calling care, but really like we all know is just about controlling an epidemic… The danger to me is like, do we further alienate people and you know, when we don't integrate things into a larger care model, like is it worth it? Like does it maybe have more long-term risks in our ability to like talk about HIV more productively as an individual health problem that deserves care in and of itself, even if it's, even if it were not contagious, you know what I mean?" -CBO staff member, HIV care services*

Fragmentation of existing patient-provider relationships and discontinuity of care

There was an additional concern that care using an MHC model would fracture existing patient-provider relationships, especially if a patient's primary HIV physician is not on the MHC van and they are now primarily seen by an advanced practice provider. This additionally has the potential to create a discontinuity of care. Participants expressed the necessity that patient care on an MHC should be integrated into the wider healthcare system in order to maintain continuity of care and mobile HIV care should possibly be used as a re-engagement tool rather than a long-term retention strategy so that fragmentation of patient-provider relationships is limited.

> *"I don't want them to feel like that's their group of providers and I'm kind of the person over here in clinic that will see ya when kind of you know when, when you can make it… I love my patients and I love my relationships with them and I don't want to lose it because of, because of this… I would want the goal of the HIV um mobile clinic, that that goal is to get you back to me… And when you're getting things second hand it's just never the same. Yeah, like a little sheet of paper that tells me what the viral load is, etc. Of course I'm gonna be you know enthused if they're, they're doing well, but you're gonna feel like less of my patient if you're spending a lot of time here." -Healthcare provider*

Environmental-level barriers and related facilitators

At the environmental level, barriers to an effective MHC model include community acceptance and safety. Facilitators to community acceptance and safety are also described here.

Community acceptance and safety

Successfully providing HIV care and services on an MHC van depends on community acceptance and safety within a community. Negative community perceptions of the MHC van may spur stigmatizing action towards patients, make it a target for violence or hatred, and deter patients from utilizing the services. Participants described that community acceptance could be facilitated by partnering with organizations who are trusted by the community and support mobile HIV care, seeking support from local government, and seeking and addressing community concerns before implementation. An MHC model can be promoted as a way to improve wellness in the community, rather than specifically labeling it as an HIV care van. Embedding HIV care within additional health services may make it more acceptable to the community where it is placed.

> *"[The MHC] might cause a ruckus, you know, where - the again, like, if you drive it out to park in [mall in Atlanta] parking lot what does that neighborhood think about that. So you know, just finding a safe spot where - you know, and deciding are you guys going to do it as a scheduled thing, like, you know, every Tuesday you're in this parking lot or this, you know, street corner from 10 until 5 or just being consistent like that, that people know where you are." -CBO staff member, HIV mental health support*

> *"For me, if it's advertised as [healthcare institution] Infectious Disease Clinic in the mobile unit or any of those other sites, it's yelling, "What's going on?" […] Even subtle things … but I think if the community were to pick up on that, they might start associating that stigma with it, too. So I agree with you that having a very bland name that wouldn't really suggest anything, and maybe… But still coming from [healthcare institution], but also with the mobile care. If they were able to provide services to everyone." -CBO staff member, Nutritional services for PLWH*

Discussion

Main Findings

Retention in HIV care is an important step in the HIV treatment cascade which impacts population-level epidemic control as well as individual-level health outcomes for PLWH. While a wide range of retention strategies exist, the United States still falls short of its retention goals, necessitating research into novel strategies to re-engage and retain PLWH. While mobile health care models have been used to reach vulnerable patient populations who are not reached by traditional health care models, their use to deliver HIV care has not been explored extensively in the published literature. This study presents the first formative research examining key stakeholder perspectives of the potential advantages of mobile HIV care over community-based and traditional models of care as well as barriers and associated facilitators to successful implementation of a mobile HIV care model.

Participants described major potential benefits (table 2) of MHCs if a variety of barriers were addressed in the design and implementation of the model. The advantages of MHCs to deliver HIV care described by study participants are similar to previously described advantages of mobile health clinics used for other purposes: ability to overcome barriers to health care access faced by vulnerable populations such as transportation and geographic barriers, financial barriers, and perceived absence of patient-centered care; ability to increase patient trust in providers; and ability to enhance understanding on the part of providers about additional barriers patients face.[22, 40] There is minimal published literature about mobile health clinics used for HIV care and thus comparisons to previous literature are difficult to make. Pilot and exploratory descriptive data from studies exploring the use of MHCs that provide HIV care in the context of syringe exchange programs[31] or other primary care[32, 33] domestically, and the use of MHCs to scale up HIV care in rural settings in Sub-Saharan Africa,[35, 37] have also described advantages of MHCs in reaching traditionally difficult-to-engage populations.

In synthesizing the study findings on barriers and facilitators to MHC implementation as a strategy for retention in HIV care, five key considerations emerged from the data and are depicted in Figure 1. These include adequacy of strategies for reaching and engaging patients,

Figure 1. Key Considerations to Implementation of a Mobile HIV Care Model to Reach People Living with HIV who are Out of Care

patients' sense of physical and emotional comfort with the MHC, breadth of services provided, the community context in which the MHC is implemented including community acceptance as well as safety of the physical environment, and cost. Attention to the various dimensions of these factors will be key in determining the ultimate acceptability and feasibility of an MHC as an alternative model of HIV care.

The adequacy of strategies to reach and engage patients who are out of care is an important consideration that will affect whether patients know about and utilize an MHC. Other mobile care studies have highlighted challenges in reaching and engaging patients as well. For example, 60% of providers and staff from eight community-based organizations that provide mobile HIV testing and counseling across the U.S. described locating people to disclose confirmatory test results as a challenge.[24] Some studies have captured community-member awareness of mobile health clinics within their catchment area using street-intercept surveys post-implementation to determine whether people had heard of or seen a specific mobile clinic.[39] However, these clinics provided services to the wider community rather than a specific population of existing patients and thus their methods of engagement (i.e. posting signs on the mobile unit, posting or distributing promotional materials in targeted areas, print advertising, television and radio advertising) are not as applicable for the purposes of engaging a select population of patients living with HIV who are out of care. Our study highlighted modes of communication (i.e. by clinic staff, phone calls, flyers, word of mouth) as well as message content and style (i.e. non-stigmatizing messaging, caring tone) important in order to maximize the number of patients who know about the MHC model and convey it in a way that facilitates utilization.

Patients' sense of physical and emotional comfort with the model is vital to utilization and is greatly affected by their perceived levels of stigma and capacity of the MHC to maintain confidentiality and safety while delivering care. These considerations were highly important to stakeholders; facilitators to enhance comfort, safety, and confidentiality and reduce stigma are shown in Figure 2. Because of pervasive HIV-related stigma, when designing mobile HIV care models as opposed to other models of care, special attention must be dedicated to the

development of strategies to preserve confidentiality and safety and ensure physical and emotional comfort. The limited amount of previous research on mobile HIV care presents no discussion of patients' physical and emotional comfort, however it is possible these considerations were included in formative research, addressed before implementation, and not reported in published literature. The studies instead focus on health outcomes and effectiveness of mobile HIV clinics. This study describes in detail the importance of stigma, confidentiality, and safety as well as potential facilitators to overcome the major concerns they present among stakeholders, shown as bulleted considerations in Figure 2. Attention to these considerations will be vital for acceptable and successful implementation of mobile HIV care in the U.S. and especially the southern region of the U.S. where this study was implemented.

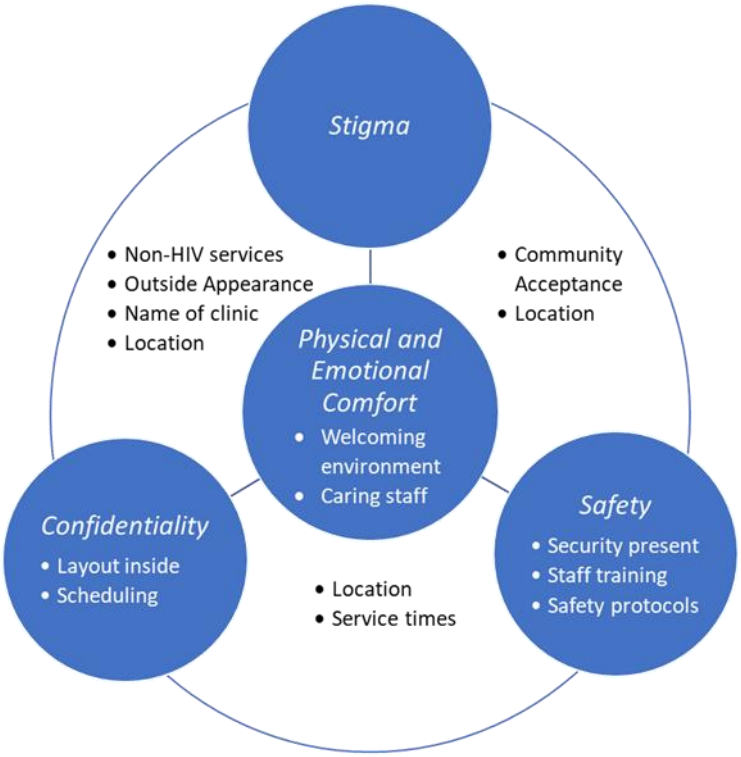

Figure 2: Key Considerations Impacting Patients' Physical and Emotional Comfort with a Mobile HIV Clinic Model
Note: Bulleted points describe design and implementation considerations which will impact the key considerations (italicized) under which they fall or are neighboring

Ensuring a breadth of services offered on an MHC (including HIV and non-HIV) are important to the quality of care it can provide, its effectiveness in improving retention outcomes, incentivizing patients to utilize it, protecting the privacy and confidentiality of patients who

utilize it, and mitigating stigma associated with it. Other studies of mobile health clinics, including Mercy Care's Mobile Health and Street Medicine Program[32, 34] and the New Haven Needle Exchange Program,[31] also stressed the importance of providing multiple services to meet the needs of patients and promote utilization. While provision of HIV services has not been the primary medical goal within these or other examples of mobile health care in the U.S., provision of other services such as primary care for people who are homeless and syringe exchange and substance abuse support for PWID has been used to successfully engage PLWH from these sub-populations whose needs are unmet by traditional models of health care. In a study of 134 Hepatitis B vaccine-eligible PWID accessing the New Haven Needle Exchange Program, 77% of patients completed two vaccinations and 66% completed all three vaccinations, with those that completed all three vaccinations more likely to be older, to inject daily, and to be homeless.[30] This demonstrates a high retention rate and the fact that, despite no monetary incentives, additional services to meet the multiple needs of patients may increase retention on mobile health clinics.[30] The present study echoes the benefit that provision of multiple services on an MHC has for fostering acceptance, and additionally highlights the potential advantages for mitigating stigma and protecting the privacy and confidentiality of PLWH accessing the MHC.

The community context in which an MHC is implemented (i.e. existence of safe spaces, parking availability, local regulations, community-level stigma around HIV) and potential facilitators to community acceptance and safety (i.e. partnering with trusted community organizations, support of local government, implementation of safety and security plans) are important considerations affecting the safety and acceptability of the model. The persistent stigma associated with HIV, often influenced by locally specific social norms and attitudes, makes context a more important consideration in delivering mobile HIV care over other mobile

health care for non-stigmatized diseases. There is promising literature reporting a high level of community acceptance of an HIV and STD mobile testing clinic in Baton Rouge, Louisiana[39] and a mobile HIV clinic in rural Mozambique.[52] In Baton Rouge, a street-intercept survey was used after implementation to determine community attitudes towards a testing clinic.[39] In Mozambique, key stakeholders (including community leaders, health care providers, traditional healers, and patients) were interviewed prior to implementation of the MHC about barriers to health services and mobile health clinic acceptance.[52] These informants emphasized the importance of including community leaders and members in the planning of the mobile health clinic.[52] Examples of mobile health care in the literature often describe implementation choices specific to the local context or target population, implying a need to take community context into consideration. The results of this study describe considerations of community context that are of particular importance to implementation of a mobile HIV clinic, beyond what might need to be considered when implementing other mobile health care.

Finally, cost was raised as an important consideration in MHC adoption, with the potential of limited use and cost-effectiveness being areas of concern. This echoes research in which providers involved in mobile HIV testing and counseling thought that mobile testing units were worth the monetary investment but also cited start-up and maintenance costs as a substantial challenges.[24] This research elucidates cost considerations, and ways to increase cost-effectiveness as well as enhance utilization to overcome variable use (and underutilization) concerns (i.e. scheduled appointments over walk-in, offer multiple services, rotate provision of services).

Strengths

The study has several strengths. First, it is innovative. Formative research gathering key stakeholder perspectives of a mobile HIV care model has not been published previously in the United States. This innovative study fills a gap in knowledge about mobile HIV care delivery in the U.S. and is the first to describe necessary components, potential advantages, and potential barriers to implementation of a mobile HIV clinic.

A second major strength of this study was the variety of stakeholders interviewed and the depth of information obtained from each participant. Gathering perspectives from a range of clinic staff members, Community Advisory Board members, community-based organizations that provide HIV-related services and support, organizations with existing mobile clinics, and institution and city regulatory officials will foster the development of a model that is more likely to be accepted, feasible, and safe.

Third, the study took place in a major city in the southern region of the United States, where the greatest regional burden of the HIV epidemic lies, and retention outcomes are poor among PLWH. Understanding new ways to improve retention in HIV care in this region is especially important and can have a large potential impact if new models are proven successful. Additionally, this study took place within a Ryan White-funded clinic; which will foster future scaling across Ryan White clinics in the U.S.

Utilizing in-depth interviewing enabled the research team to probe participants to fully understand the complexity of opinions related to MHCs and fostered identification of new ideas for strategies to foster MHC acceptance. Importantly, we engaged the Community Advisory Board before implementation to review the study protocol to garner support, ensure the study protocol was attentive to the sensitive topics such as stigma and confidentiality, and study tools were clear. During this process, visual aids were added that provided a clearer explanation of

new community-based models of care for participants. This revision process ensured participants were considered at the center of the study processes.

Additionally, the team of interviewers were selected for their theoretical grounding in qualitative research, ability to communicate sensitive topics, and previous experience working with vulnerable populations and PLWH, ensuring an ethical, effective, and respectful interview process.

Lastly, multiple study team members reviewed and coded initial transcripts which led to the development of the codebook and all interviewers were coded by two coders and discussed until consensus was reached, decreasing subjectivity in the coding and analysis process.

Limitations

The study also has limitations. First, patient perspectives were excluded from this thesis. Patients were surveyed and interviewed as part of the larger mixed-methods parent study, however, are not included in these results because enrollment of patients was still underway at the time of submission. While the range of key stakeholders included in the study was diverse and encompassing of expertise the research team thought relevant to the research question, it is possible some perspectives that could shed light on specific components of implementation were missed. One perspective missing was that of information technology professionals who could speak to the feasibility, potential barriers, and potential facilitators to operating a mobile HIV clinic using available technology. This perspective should be consulted during the design phase of the mobile HIV clinic model.

Additionally, the single-site recruitment of providers, CAB members, and regulatory officials limits the transferability of the findings to clinics that differ from this site (i.e. by patient population, resources, staffing, clinic and/or community culture). Participants were asked

specifically about implementing a mobile HIV clinic within their institution, thus relevance of responses to other settings and patient populations is not known and should be the basis of future studies.

Conclusions

In conclusion, this study is the first to describe key advantages of mobile HIV care for PLWH who have fallen out of care (Table 2) and necessary considerations for the mobile HIV care model to be acceptable and effective. The key considerations include the development of effective strategies for reaching and engaging patients, attending to patients' physical and emotional comfort by addressing stigma, confidentiality, and safety concerns, providing HIV and non-HIV services that are needed and wanted by PLWH, evaluating community context in terms of safety and acceptability, and evaluating the cost of implementation and cost-effectiveness. Development of an MHC should be responsive to these factors in order to be acceptable and successful. It will be important to analyze patient perspectives in future studies to determine if they align with stakeholder perspectives and what additional considerations should be added to these results. The larger mixed-methods parent study also gathered specific recommendations on the details of implementation such as acceptable locations, timing and frequency of providing services, how an MHC should look including potential names, and what providers and services should be available on an MHC. These details should be analyzed and described in order to further inform development and implementation of an MHC model. Once a model is developed, it should be shared with key stakeholders in order to obtain additional feedback and recommendations to enhance acceptability and effectiveness. It would also be valuable to understand community attitudes towards a mobile HIV clinic prior to implementation in order to

facilitate context-specific acceptance and safety measures within the community.

Chapter Four: Public Health Implications

This study has provided important groundwork to show that MHCs have potential advantages over traditional clinic-based models of HIV care in retaining PLWH who have fallen out of care, and identify important barriers and strategies to overcome the barriers to successfully design and implement a mobile HIV care model. Thus, the study has key implications for the design of a feasible and acceptable model of HIV care for PLWH who have fallen out of care. Next steps include development of potential MHC models integrating study findings, allowing for additional review and feedback from stakeholders to further foster acceptance of the ultimate care model. Thereafter, the model will be pilot tested, refined, and then undergo further study to assess its effectiveness compared to the standard of care (clinic-based HIV care). If proven effective, a mobile HIV care model has the potential to be adapted and scaled to other RWP clinics in the U.S. Thus, an acceptable MHC model has the potential to reach patients that were lost to follow up from traditional HIV clinics, enhance retention in care and viral suppression, and improve HIV-related health outcomes for the approximately 581,000[41] PLWH in the U.S. who are out of care.

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Appendices

Appendix A: Interview Guides and Visual Aids

Qualitative Interview Guide: Staff and Providers

Introduction:

At the Emory Infectious Diseases Clinic and Ryan White Program, approximately 250 patients each month remain out of care so we are exploring new ways to bring HIV services to patients that have fallen out of care. Nationally, common interventions to retain patients, such as patient navigators, case managers, transportation assistance, appointment reminders, and contingency management, have demonstrated some efficacy but still fall short of national targets for HIV care retention. So, we are interested in understanding the needs, barriers, and facilitators to implementation of new community-based HIV care models for patients who are out of HIV care.

I'm going to record our conversation in order to best capture your responses. To maintain confidentiality, I ask that you please try to avoid providing information that may identify specific patients or other people. If by accident you do, we will be sure to remove any identifying information when we transcribe the interview. Please take a minute to put your cell phone on silent. Do you have any questions before we begin?

Ok, let's get started. May I begin the recording?

What is your role in the Emory Infectious Diseases Clinic or Ryan White program at present?

View of barriers and facilitators to PLWHIV-OOC staying in care

State: There are many reasons a patient may fall out of care or stay in care.

What are the main barriers contributing to your patients falling out of care?

What are the main facilitators to your patients remaining in care?

Thinking about the patients we have the most difficult time retaining in care, what strategies have been most effective in retaining or re-engaging these patients? *(probe: Individual strategy as a provider, clinic-level strategies)*

State: Health care environment can contribute to retention in HIV care.

Can you describe the areas you feel the Emory ID Clinic/RWP is strong in retaining patients?

Can you describe the areas you feel the Emory ID Clinic/RWP is falling short in retaining patients?

Do you feel there is a need in finding alternative methods for re-engaging and retaining people who live with HIV who have fallen out of care?
(probe: Why or why not?)

Do you have ideas on new methods to re-engage and retain out of care patients?

State: We'd now like to explore your thoughts on a few specific novel community-based models of HIV care. These are represented on the response card in front of you and include:

-A mobile HIV treatment clinic. In this case, a large medical van would come directly to the community where patients live to provide them with HIV care and support services. They would walk directly into the mobile van where they would be seen by an HIV care team.

-A community-based Peer Navigator, who would bring patients to and from home to their HIV care visit, show them around the hospital, and make sure all their questions and concerns were answered along the way.

-HIV telemedicine, where patients could receive some aspects of their medical care such as mental health support, social work support, and have some medical concerns addressed through video conference.

-Incorporating HIV care into primary care clinics. Patients would not be directly seen by an HIV care/infectious diseases specialist, rather an HIV care specialist would train a patient's primary care doctor and work with them by phone to provide their HIV care.

-Providing HIV care at shelters or transitional housing facilities where patients live. If they were receiving mental health or substance abuse counseling services, patients would get HIV care alongside these services at the facility.

-And finally, providing HIV care at a drug treatment center. If they were receiving mental health or substance abuse counseling services, patients would get HIV care alongside those services at the drug treatment facility.

State: We'd like to hear your thoughts on some of these potential programs.

Do any of these ideas stand out to you as potentially being effective?
(probe: Which one(s)? Why?)

Thinking about *[insert effective strategy mentioned by participant]*, tell me more about what you think this model of care should look like.
(probe: services to be provided, characteristics of care providers, characteristics of patients, timing/frequency of care, barriers, facilitators, advantages/disadvantages, confidentiality/safety concerns and strategies to overcome them)

How would you prioritize patients to receive this strategy of care?
(probe: characteristics of patients, strategies)

Imagine you were one of the *[insert participant clinic role]* involved in the *[selected new model for care]*. How would operating within this new model of care change the quality of care you could give?

What barriers would you face to delivering care?

What would facilitate your provision of HIV care using this strategy?

(probe: technology, personnel, support, safety)?

Provider viewpoint on mobile HIV treatment clinic

State: We'd now like to explore more the safety, feasibility, and efficacy of delivering care in an HIV mobile treatment clinic.

What is your opinion on this specific alternative care option?
(probe: Potential effectiveness? Advantages/weaknesses?)

How does mobile HIV care compare to other possible models of alternative HIV care?

What barriers as a *[insert role]* do you see to your provision of care using the mobile HIV care clinic?
(probe: safety, confidentiality, time, support, technology)

What would you need to provide adequate care as a *[insert role]* on a mobile HIV care clinic?
(probe: van outfitting (minimal clinical instruments, setup), technology, personnel, support, safety)

What do you think our clinic can do to increase the safety, comfort, and maintenance of confidentiality/privacy of our patients if we provided care in this setting?
(probe: naming/branding of van (so that only Emory patients living with HIV would access services – while maintaining confidentiality), location/timing of van, considerations in provision of care to multiple patients from one community, approach of patients in community to bring them into and remind them of mobile care)

Other thoughts on how we could make mobile HIV treatment more effective, acceptable, and safe?
(probe: minimal services provided (clinical, social work/case management, mental health, substance abuse counseling, peer counseling, medication adherence, laboratories), patient prioritization, patient incentives, characteristics of HIV care providers)

Other thoughts or concerns about feasibility of mobile HIV treatment?
(probe: billing, medical record keeping, patient tracking, frequency of visits, sustainability, legal/compliance concerns, cost, staffing)

State: Thank you for participating in the interview. We will use your responses to help build a community-based HIV care program for patients who have fallen out of care. **Do you have any final comments you want to share about your needs or preferences in delivering HIV care either on or off recording?**

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*
[Turn off e-recorders]

Qualitative Interview Guide: Community Advisory Board members

Introduction:
At the Emory Infectious Diseases Clinic and Ryan White Program, approximately 250 patients each month remain out of care so we are exploring new ways to bring HIV services to patients that have fallen out of care. Nationally, common interventions to retain patients, such as patient navigators, case managers, transportation assistance, appointment reminders, and contingency management, have demonstrated some efficacy but still fall short of national targets for HIV care retention. We are interested in understanding the needs, barriers, and facilitators to implementation of new community-based HIV care models for patients who are out of HIV care.

I'm going to record our conversation in order to best capture your responses. To maintain confidentiality, I ask that you please try to avoid providing information that may identify specific patients or other people. If by accident you do, we will be sure to remove any identifying information when we transcribe the interview. Please take a minute to put your cell phone on silent. Do you have any questions before we begin?

Ok, let's get started. May I begin the recording?

Tell me why and how you got involved with the Emory Midtown Community Advisory Board?

State: We understand that there are many reasons a patient may fall out of care or stay in care.

What are the main barriers that make it hard for someone to stay in care?

What type of services or resources make it easier for someone to stay in care?

Describe a time when you had challenges remaining in care. (Probe: What made it easier for you to stay in care?)

Describe your ideal way for you to get HIV care. (Probe: Location. Time of day. Characteristics of person to deliver care. Services provided. Etc.)

Can you describe the areas you feel the Emory ID Clinic/RWP is falling short in keeping patients in care?

In what ways can we engage, or encourage patients who have fallen out of care to get back into care?

State: Now we will explore your thoughts on a few specific novel community-based models of HIV care. These are represented on the response card in front of you and include:

-A mobile HIV treatment clinic. In this case, a large medical van would come directly to the community where patients live to provide them with HIV care and support services.

They would walk directly into the mobile van where they would be seen by an HIV care team.
-A community-based Peer Navigator, who would bring patients to and from home to their HIV care visit, show them around the hospital, and make sure all their questions and concerns were answered along the way.
-HIV telemedicine, where patients could receive some aspects of their medical care such as mental health support, social work support, and have some medical concerns addressed through video conference.
-Incorporating HIV care into primary care clinics. Patients would not be directly seen by an HIV care/infectious diseases specialist, rather an HIV care specialist would train a patient's primary care doctor and work with them by phone to provide their HIV care.
-Providing HIV care at shelters or transitional housing facilities where patients live. If they were receiving mental health or substance abuse counseling services, patients would get HIV care alongside these services at the facility.
-And finally, providing HIV care at a drug treatment center. If they were receiving mental health or substance abuse counseling services, patients would get HIV care alongside those services at the drug treatment facility.

Which of these ideas stand out to you as potentially being effective?
(Probe: Why?)

Tell me more about what you think this (selected) model of care should look like.
(probe: services to be provided, characteristics of care providers, characteristics of patients, timing/frequency of care, barriers, facilitators, advantages/disadvantages, confidentiality/safety concerns and strategies to overcome them)

Imagine you were one of the patients utilizing this *[selected new model for care]*. Describe what your care visit would look like? (Probe: What happens when you arrive? What services do you receive? Who do you interact with? How long is the visit?)

What barriers would you face to delivering care?

What would make you most likely to use [Selected mode of care]?
(probe: technology, personnel, support, safety)?

CAB perceptions of mobile HIV treatment clinic

State: We'd now like ask you questions about delivering care in an HIV mobile treatment clinic.

What is your opinion on utilizing a mobile HIV treatment clinic?
(probe: Potential effectiveness? Advantages/weaknesses?)

How does mobile HIV care compare to other possible models of alternative HIV care?

What challenges may we have with trying to deliver care using the mobile HIV care clinic? *(probe: safety, confidentiality, time, support, technology)*

What type of services are needed to provide adequate care on a mobile HIV care clinic?

What do you think our clinic can do to increase the safety, comfort, and confidentiality/privacy of our patients if we provided care in this setting? *(probe: naming/branding of van (so that only Emory patients living with HIV would access services – while maintaining confidentiality), location/timing of van, considerations in provision of care to multiple patients from one community, approach of patients in community to bring them into and remind them of mobile care)*

What other thoughts do you have on how we could make mobile HIV treatment more acceptable and safe?

What other thoughts or concerns do you have about feasibility of mobile HIV treatment?

What role do you see the CAB having in developing and implementing the mobile HIV treatment model?

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*

State: Thank you for participating in the interview. We will use your responses to help build a community-based HIV care program for patients who have fallen out of care. **Do you have any final comments you want to share about your needs or preferences in delivering HIV care either on or off recording?**

[Turn off e-recorders]

Qualitative Interview Guide: CBOs Providing HIV Clinical and Supportive Care

Introduction

The Emory Infectious Diseases Clinic and Ryan White Program are exploring ways to bring HIV care into the community. Approximately 250 patients each month remain out of care, so we are exploring new ways to bring HIV-related services to patients that have fallen out of care. Nationally, common interventions to retain patients, such as patient navigators, case managers, transportation assistance, appointment reminders, and contingency management, have demonstrated some efficacy but still fall short of national targets for HIV care retention. So, we are interested in understanding the needs, barriers, and facilitators to implementation of new community-based HIV care models for patients who are out of HIV care.

I'm going to record our conversation in order to best capture your responses. To maintain confidentiality, I ask that you please try to avoid providing information that may identify specific patients or other people. If by accident you do, we will be sure to remove any identifying information when we transcribe the interview. During the data analysis phase of this project, the name of your organization and other identifying information will be removed. Please take a minute to put your cell phone on silent. Do you have any questions before we begin? Ok, let's get started. May I begin the recording? [turn on e-recorders]

Background

What is the name of the organization you currently work for?

Describe the work *[insert name of identified organization]* does. *(probe: Types of services provided? Clinical? Supportive? Linking to resources?)*

Describe your role at *[insert name of identified organization]*. *(probe: Daily processes? How are you engaging with the community?)*

Barriers and Facilitators on Engagement in Care

Tell me about your patient population.

What are the main barriers you've identified as contributing to people not remaining in HIV-related care? *(probe: Transportation, stigma, etc.?)*

What are the main facilitators you've identified as contributing to people remaining in HIV-related care? *(probe: Support system, good relationship with provider, etc.?)*

State: The environment patients receive HIV care can contribute to their retention in care.

Describe the areas you feel *[insert name of identified organization]* is strong in engaging with the community. *(probe: Why are these areas important?)*

Proposed Community-Based HIV Care Models

State: We'd now like to explore your thoughts on a few specific community-based models of HIV care. These are represented on the response card in front of you and include:

- A mobile HIV treatment clinic. In this case, a large medical van would come directly to the community where patients live to provide them with HIV care and support services. They would walk directly into the mobile van where they would be seen by an HIV care team.
- A community-based Peer Navigator, who would bring patients to and from home to their HIV care visit, show them around the hospital, and make sure all their questions and concerns were answered along the way.
- HIV telemedicine, where patients could receive some aspects of their medical care such as mental health support, social work support, and have some medical concerns addressed through video conference.
- Incorporating HIV care into primary care clinics. Patients would not be directly seen by an HIV care/infectious diseases specialist, rather an HIV care specialist would train a patient's primary care doctor and work with them by phone to provide their HIV care.
- Providing HIV care at shelters or transitional housing facilities where patients live. If they were receiving mental health or substance use counseling services, patients would get HIV care alongside these services at the facility.
- And finally, providing HIV care at a drug treatment center. If they were receiving mental health or substance use counseling services, patients would get HIV care alongside those services at the drug treatment facility.

State: We'd like to hear your thoughts on some of these potential programs.

Which of these care models stands out to you the most as being effective in reengaging and retaining patients into care? *(probe: Which one(s)? Why?)*

Thinking about *[insert effective strategy mentioned by participant]*, tell me more about what you think this model of care should look like. *(probe: services to be provided, characteristics of care providers, characteristics of patients, timing/frequency of care, barriers, facilitators, advantages/disadvantages, confidentiality/safety concerns and strategies to overcome them)*

How would *[insert effective strategy mentioned by participant]* impact or change the quality of care patients would receive?

Which of these care models stands out to you the most as being least effective in reengaging and retaining patients into care? *(probe: Which one(s)? Why?)*

CBO Viewpoint on Mobile HIV Treatment Clinic

State: We'd now like to explore the safety, feasibility, and efficacy of delivering care in a mobile HIV treatment clinic.

What is your opinion on this specific care model option for reengaging and retaining patients into care? *(probe: Effectiveness? Advantages? Disadvantages? Feasibility?)*

How does the mobile HIV clinic model compare to the other possible models we previously talked about?

What are the challenges or barriers when using the mobile HIV care model? *(probe: safety, confidentiality, location, time, space)*

What do you feel would be needed to provide adequate care to patients using the mobile HIV care model? *(probe: size of van, space, personnel, etc.?)*

How do you think patient safety, privacy, and confidentiality could be achieved when using the mobile HIV care model? *(probe: naming/branding of van (so that only Emory patients living with HIV would access services – while maintaining confidentiality), location/timing of van, considerations in provision of care to multiple patients from one community, approach of patients in community to bring them into and remind them of mobile care)*

What are the minimal services that should be provided on the van? *(probe: clinical, social work, case management, mental health, substance use counseling, peer counseling, etc.?)*

Other thoughts or concerns about the feasibility of a mobile HIV treatment clinic?

As a CBO that provides HIV care services, would a mobile HIV van from Emory benefit the patients you serve or fit into the care that your organization provides? Why or why not?

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*

State: Thank you for participating in the interview. We will use your responses to help build a community-based HIV care program for patients who have fallen out of care.

Do you have any final comments you want to share about your needs or preferences in delivering HIV care either on or off the recording?

[Turn off e-recorders]

Qualitative Interview Guide: Staff/Provider at another agency who uses mobile care (i.e. for HIV testing or other diseases)

Introduction:
At the Emory Infectious Diseases Clinic and Ryan White Program, approximately 250 patients each month remain out of care so we are exploring new ways to bring HIV services to patients that have fallen out of care. Nationally, common interventions to retain patients, such as patient navigators, case managers, transportation assistance, appointment reminders, and contingency management, have demonstrated some efficacy but still fall short of national targets for HIV care retention. So, we are interested in understanding the needs, barriers, and facilitators to implementation of new community-based HIV care models for patients who are out of HIV care. We are currently reaching out to organizations that have mobile clinics in place (either HIV-related or not) to hear more about your perspective on implementing this type of care.

I'm going to record our conversation in order to best capture your responses. To maintain confidentiality, I ask that you please try to avoid providing information that may identify specific patients or other people. If by accident you do, we will be sure to remove any identifying information when we transcribe the interview. During the data analysis phase of this project, the name of your organization and other identifying information will be removed. Please take a minute to put your cell phone on silent. Do you have any questions before we begin?

Ok, let's get started. May I begin the recording?

[For the purposes of this interview] What's the name of the agency for whom you work?

Tell me a little about the purpose or mission of this agency.

What is your role at the agency?

Provider viewpoint on mobile HIV treatment clinic

State: There are many reasons a patient may fall out of care or stay in care.

If you're aware from your position at the agency, what were the contributing factors that led to the development and implementation of your mobile clinic?
(probe: barriers to care, stigma surrounding type of services provided)

What strategies does your organization use to keep patients remained in care?

State: Health care environment can contribute to retention in HIV care.

State: We'd now like to explore more the safety, feasibility, and efficacy of delivering care in an HIV mobile treatment clinic.

As somebody who works at an agency experienced in delivering care via mobile van, what is your opinion on this specific alternative care option?

(probe: Potential effectiveness? Advantages/weaknesses?)

If your agency provides care in a clinic or non-mobile setting, how does mobile care compare to other possible models of care provision? And other retention strategies? *(probe: telehealth, peer navigation, etc.)*

What barriers do you see to providing care in a mobile clinic?
(probe: safety, confidentiality, time, support, technology)

What elements or qualities do you think help to provide adequate care on a mobile clinic?
(probe: van outfitting (minimal clinical instruments, setup), technology, personnel, support, safety)

What do you think our clinic can do to increase the safety, comfort, and maintenance of confidentiality/privacy of our patients if we provided care in this setting? *(probe: naming/branding of van (so that only Emory patients living with HIV would access services – while maintaining confidentiality), location/timing of van, considerations in provision of care to multiple patients from one community, approach of patients in community to bring them into and remind them of mobile care)*

Other thoughts on how we could make mobile HIV treatment more effective, acceptable, and safe? *(probe: minimal services provided (clinical, social work/case management, mental health, substance abuse counseling, peer counseling, medication adherence, laboratories), patient prioritization, patient incentives, characteristics of HIV care providers)*

Other thoughts or concerns about feasibility of mobile HIV treatment?
(probe: billing, medical record keeping, patient tracking, frequency of visits, sustainability, legal/compliance concerns, cost, staffing)

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*

State: Thank you for participating in the interview. We will use your responses to help build a community-based HIV care program for patients who have fallen out of care. **Do you have any final comments you want to share about your needs or preferences in delivering HIV care either on or off recording?**

[Turn off e-recorders]

Qualitative Guide: Emory regulatory, billing, and medico-legal compliance experts and Atlanta city officials

Introduction:
At the Emory Infectious Diseases Clinic and Ryan White Program, approximately 250 patients each month remain out of care, so we are exploring new ways to bring HIV services to patients that have fallen out of care. Nationally, common interventions to retain patients, such as patient navigators, case managers, transportation assistance, appointment reminders, and contingency management, have demonstrated some efficacy but still fall short of national targets for HIV care retention. So, we are interested in identifying strategies to enhance the acceptability, feasibility, and safety of a new community-based HIV care model for patients who are out of HIV care.

I'm going to record our conversation in order to best capture your responses. Please take a minute to put your cell phone on silent. Do you have any questions before we begin?

Ok, let's get started. May I begin the recording?

What is your role [at Emory / in the city of Atlanta] at present?

State: One idea our clinic has to reach patients who have fallen out of care is a mobile HIV treatment clinic. This would mean that a large medical van would come directly to the community where patients live to provide them with HIV care and support services. They would walk directly into the mobile van where they would be seen by an HIV care team.

We'd like to hear your thoughts as a [insert participant role] on delivering care through a mobile HIV clinic. [show participant response card]

Note to Interviewer: Skip to relevant section based on role - I. Emory Staff II. City of Atlanta Official

I. Emory Regulatory, Billing, and Medico-Legal Compliance Experts

Multi-level barriers/facilitators to mobile HIV care

In terms of your role at Emory:

What factors would be needed to carry out a mobile HIV clinic successfully?

What (resources/support) would you need to be able to implement this type of program as a [insert participant role]?
(probe: what other departments/positions would you need support from, what resources would you need…)

What barriers do you see to successful implementation of this type of care?

What other concerns do you have for implementing mobile HIV care at Emory? *(probe: regulatory, billing, legal, frequency, timing)*

Considerations for outfitting MHC vehicle (i.e. branding to maintain confidentiality, computers and technology, medical facilities)

What considerations do you have for how a mobile HIV clinic should look on the *outside*, in order to be compliant with Emory standards but maintain patient confidentiality? *(probe: branding requirements)*

What considerations do you have for how a mobile HIV clinic should look on the *inside*, in order to be compliant with Emory standards? *(probe: minimal facilities, equipment, personnel required)*

What feasibility concerns do you have for the mobile HIV clinic? *(probe: technology, equipment, legal)*

Preference/consideration for MHC location (including parking and licensing)

What should the clinic consider when deciding where the mobile clinic can be parked? *(probe: Are there Emory restrictions? Is there anywhere it should not be parked?)*

Cost estimation and reimbursement mechanism

In terms of your job function/area of expertise, how would you estimate the cost of providing care on a mobile clinic?

How could Emory fit mobile HIV care into current practices and policies on reimbursements? *(probe: current billing practices, legal security, policies, etc.)*

Safety and confidentiality concerns (environmental, data security, community-based security services)

What confidentiality concerns would you have for operating a mobile clinic?

What (resources or support) would you need from our mobile HIV clinic to address Emory's confidentiality concerns?

How would operating in a mobile clinic change data security practices in your role as a [insert participant role]?

What personal safety and security concerns would you have about operating a clinic in a community-based setting? *(probe: environmental concerns, personal safety)*

What (resources or support) would you need from our mobile HIV clinic to address these safety and security concerns?

State: Thank you for participating in the interview. We will use your responses to help build a community-based care model to re-engage patients who have fallen out of care at our clinic. **Do you have any final comments you want to share about your needs or preferences in delivering HIV care via a mobile clinic or other community-based care model, either on or off recording?**

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*

II. City of Atlanta Officials

Multi-level barriers/facilitators to mobile HIV care

As an official for the city, how could you see a mobile HIV clinic being carried out successfully in Atlanta?

How do you think Emory and the City of Atlanta could work together to implement this program? ?)
(probe: what other departments/positions could support, what could Emory do to foster a successful partnership, what resources would be available…)

What other departments would be necessary to speak to about implementing this program?

What barriers do you see to successful implementation of this type of community-based care?

What other concerns do you have for implementing mobile HIV care in Atlanta?
(probe: safety, traffic)

What are some ways Emory could overcome these concerns when implementing this program?

Preference/considerations for timing/days and number of visits (i.e. one time vs continuous, frequency)

What regulations does the city have on frequency or duration limits for mobile clinics in the city?

Preference/consideration for MHC location (including parking and licensing)

What should the clinic consider when deciding where the mobile clinic can be parked?
(probe: Are there city of Atlanta restrictions? Is there anywhere it should not be parked? Churches? Parks? Schools? What other departments should have input on this?)

What ideas do you have of places that would be good to park the mobile clinic?

Cost estimation

How would you estimate the municipal cost of operating a mobile clinic in Atlanta? *(probe: Permits? Licensing? Compliance to city regulations)*

Safety and confidentiality concerns (environmental, data security, community-based security services)

What safety and security concerns would you have about operating an HIV clinic in a community-based setting? *(probe: environmental concerns, public safety)*

What are ways Emory can help mitigate these safety and security concerns?

What are ways the city of Atlanta can help mitigate these safety and security concerns?

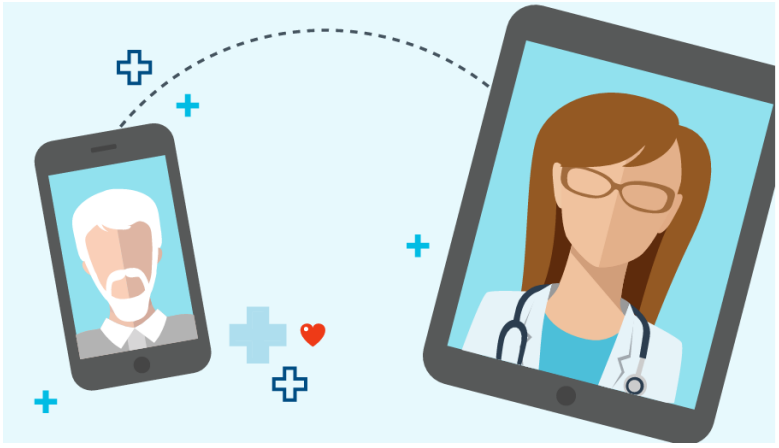
State: Thank you for participating in the interview. We will use your responses to help build a model for a community-based HIV care to re-engage patients who have fallen out of care at our clinic. **Do you have any final comments you want to share about the idea of delivering HIV care via a mobile clinic or other community-based care model, either on or off recording?**

Would you be interested in helping the ID clinic further plan and develop a model for community-based care to be implemented by the clinic? *(if yes, take contact information)*

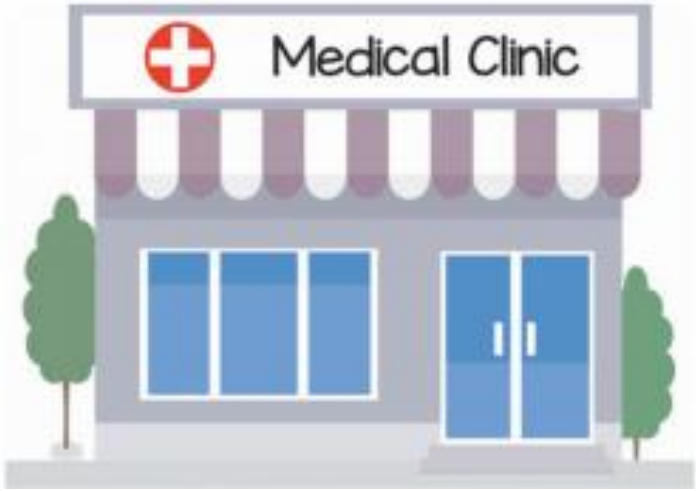
1. Mobile HIV Treatment Clinic

2. Community-based Peer Navigator

3. HIV Telemedicine



4. Primary Care Clinics



5. HIV care provided at shelters or transitional housing facilities

6. HIV care provided at a drug treatment center

7. Emory Infectious Diseases Clinic at Emory University Hospital Midtown

Appendix B: Study Protocol

Bringing the Clinic to the Community Study Protocol

Study Protocol- Recruitment

Alan Bailey will get the list of patients who have been contacted by the retention coordinator already and notified about the study. He will pass along this list to the GRAs. Alan Bailey [contact information])

List should be uploaded to Emory Box and Participant tracking database on Box should be updated with a researcher assigned to call participant.

Alan will notify GRAs if any patient has an appointment scheduled at the clinic, to see if a GRA can schedule a survey appointment after the patient's clinic appointment.

I. GRAs to contact potential participants 1 week before they would like to schedule them for a survey appointment (based on how many appointments we have that week, how many we want to survey/interview per week)
   a. Each GRA will be responsible for scheduling the participants they will interview/survey
   b. Look at schedule and check how many patients are scheduled that week
   c. Check recruitment database to see who is next on the list to be called

II. Initial contact with potential participants:
   a. GRA should be in a quiet, private place
   b. Use study phone
   c. Follow calling script:

Please have participant name and birthdate

May I please speak to (CONFIRM PARTICIPANT NAME)? *Hi my name is (_____ __) and I'm calling from the Emory Clinic, How are you today? (Allow time for response)* ***Before we start, can you confirm your birthday to ensure that I am speaking to the right person?*** **(Confirm Birthday)** *Thanks!* *I'm calling today to see if you would be interested in completing a survey that will help us make it easier for you and others in the clinic to stay in care. The survey will ask questions about any challenges you have faced in coming to the Emory Clinic and your*	

thoughts on how we can improve the care the clinic provides. The survey takes about 30 minutes to complete, and if you are interested you can take the survey here at the Emory Clinic, or we can arrange to meet at a location that works for us both. You will be compensated with a $25 gift card for your time and travel upon completing the survey. Does this sound like something you would be interested in?	
Yes: *Okay, great. Would you prefer to come here to the clinic? If so when would be a good day and time for you? (Assess participant's availability)* **If participant prefers to meet in a mutually convenient location, organize location safe, discrete, with minimal noise/distractions)**	**No:** We would love your input! If you decide that you would like to complete the survey at a later time, please contact our study team at: Main Study Phone: (404) 307-2234 Google Voice: (404) 436-1130

d. If patient would like to participate:
    i. Schedule an appointment, update participant tracking sheet, input appointment into shared Outlook calendar
    ii. If the appointment is to be at an offsite location, look at GRA availability document on Emory Box to make sure another GRA will be available to accompany at the survey appointment
    iii. Get best contact information
    iv. Inform participant that we will provide a reminder call 1 day before the appointment, and confirm their preferred method of contact (email, text, call, Whatsapp, messenger app?)
e. If patient would not like to participate:
    i. Follow calling script, give our contact information if they would like to complete the survey at a later time

III. <u>Scheduling the appointment</u>
a. Create event in shared calendar noting which GRA that has scheduled the appointment
    i. Indicate location if known or "Emory Midtown – TBD" if a room needs to be booked at Emory Midtown
    ii. Set reminder for 24 hours
    iii. Invite attendees: GRA and participant if appropriate
    iv. Indicate in body of appointment how they should be contacted for a reminder

b. Update participant tracking database to indicate that appointment has been scheduled
c. Email Alan Bailey if appointment will be at Emory Midtown asking for a room to be reserved for an hour and a half
d. If appointment is offsite, email Ameeta to let her know and let the other GRAs who have availability at that time know that you will need someone to come to the appointment
e. Email Khaleelah/Carla about the date/time you'll be accessing Ameeta's office to pick up and drop off supplies to ensure they will be there - Carla Bailey [[contact information]]; Khaleelah Muwwakkil [[contact information]]

IV. Reminder messages:

a. Each GRA will be responsible for the reminders for the appointments they have scheduled the next day
b. Follow reminder call script
    i. Confirm birthday before talking about appointment
c. Mark reminder completed in participant tracking database and note in the calendar event that reminder was completed

Reminder call script – ***Have participant name and Birthdate available***

Hi, may I please speak to (PATIENT NAME)?

Hi my name is (_____) and I'm calling from Emory, How are you today? (Allow time for response)

Before we start, can you confirm your birthday to ensure that I am speaking to the right person?

(Confirm Birthday)

(if patient is not there do not tell the person on the line any more information but tell them you will call back later to reach them)

Thank you (PATIENT NAME). I am calling to just remind you of the appointment you have on (APPOINTMENT DAY) to complete the patient survey on staying in care at the Emory clinic. We have your appointment scheduled for (TIME) on (APPOINTMENT DAY) at (LOCATION). Does this day, time, and location still work for you?

(If yes)

Great, thank you for confirming that. We look forward to seeing you then.

(If yes and location is at Emory Midtown)

Great, thank you for confirming that. A member of our study team will meet you in the lobby of Emory Midtown Hospital at the patient services desk in the main lobby by the bottom of the escalators. We will be wearing a gray lab coat, and if you have trouble finding us you can call [study phone number].

(If no)

Ok, no problem, we would be happy to reschedule a better time for you. What day or time would work better?

Would you like to meet at the same location as before?

Great, I now have you scheduled for an appointment _____.

If you have any questions before the appointment, please feel free to call us at _____. Good bye.

Study protocol – Survey Administration

I. Pre-Survey
   a. GRAs to check inbox and appointment schedule each week
      i. 24-hours prior to study visit GRA to confirm time/location with participant.
   b. Items for researcher to bring to survey appointment, will be located at RSPH in Ameeta's office. (GRAs can access the office through Khaleelah or Carla, front desk office administrators, if Ameeta is not there. Carla Bailey [[contact information]]; Khaleelah Muwwakkil [[contact information]]):
      i. Badge (must be worn on lab coat at all times)
      ii. Study lab coat
      iii. 2 e-recorders
      iv. Extra batteries
      v. Incentives (for survey and IDI)
      vi. Receipt form
      vii. Study tablet and charger
      viii. Mobile hotspot device if needed – check that it is working before going to appointment
      ix. Pen
      x. Notepad
      xi. 2 copies of survey consent
      xii. 2 copies of IDI consent
      xiii. 1 copy of locator form
      xiv. 1 paper copy of survey
      xv. 1 paper copy of IDI guide
      xvi. Copy of study protocol

II. Set-Up (the visit and/or compensation visit)
   a. Business casual clothing should be worn, closed toe shoes
   b. Ensure all your personal belongings and the study materials (including tablets and recorders) are always either locked (in 6th floor cabinet at RSPH or Ameeta's office on the 11th floor of EUHM) or with you. **Do not leave personal items or study materials unattended.**
   c. The primary location for interviews will be Emory Midtown clinic, but upon request, interviewer may schedule to meet participant at a mutually convenient

place appropriate for study visit. (*See section III for additional set-up dependent on interview location)*

III. Set-Up Based on Interview Location

a. At clinic
    i. Arrive to interview 60 minutes early
    ii. Go to Ameeta's office on the 11th floor to leave any personal belongings or items you will not bring to the survey appointment
    iii. Go downstairs to the lobby to meet patient at the patient services desk in the main lobby, bring all study materials with you
    iv. Once patient arrives, bring patient to interview room
b. At participant home (note: 2 GRAs should attend an offsite appointment and Ameeta should be notified by email when you are leaving for the field and have returned from the field. Be sure to include the address of where you are going)
    i. Upon arrival confirm name and DOB with participant
    ii. Ensure the location has privacy (no others are around)
    iii. If location appears inappropriate to conduct visit, assess the participants willingness to reschedule *(See Recruitment section III for additional information on scheduling appointments*). Reschedule or move to another location if appropriate and feasible. Let the patient know location must have privacy to continue per our study protocol.
c. At neutral location (note: 2 GRAs should attend an offsite appointment and Ameeta should be notified by email when you are leaving for the field and have returned from the field. Be sure to include the address of where you are going)
    i. Ensure that location has privacy (ex: if at coffee shop, go to a more secluded/private area)
        1. If interview is interrupted or is no longer private, prompt an unrelated previously agreed upon topic with participant
    ii. Prepare recorder and consent form, check mobile Wi-Fi connection
    iii. If location appears inappropriate to conduct visit, assess the participants willingness to reschedule *(See Recruitment section III for additional information on scheduling appointments*) Reschedule or move to another location if appropriate and feasible. Let the patient know location must have privacy to continue per our study protocol.

IV. Administering the survey

a. Introduce yourself and begin building rapport
b. Administer the written informed consent and offer him/her a chance to ask questions
c. Offer a copy of the consent form to the participant, notifying them that there is possibly sensitive information about HIV on the form
d. Ask the participant to complete a 'locator form' containing his/her name, contact information (phone, email, address), and study ID number

e. Don't offer self-administration of the survey as an option. Only if the patient asks, then let them know they may do so but that you advise against it since many of the concepts are tricky and require explanation along the way.
f. Let the patient know what topic (i.e. nutrition, exercise) you will switch to if privacy is broken during the appointment
g. If privacy is broken and cannot be restored during this time, let the patient know that another appointment will need to be scheduled to continue per the study protocol

V. If participant is interested in in-depth interview (based on answer to last two survey questions)
   a. **Explain IDI and compensation**--If participant prefers to continue with IDI the same day, proceed to IDI protocol
   b. If participant wishes to participate in IDI at a later time
      i. Schedule preferred date, time, and location for IDI
      ii. Get contact information for reminder
      iii. Write down agreed upon date/time/location for participant
      iv. Write down appointment in study calendar and participant tracking database
      v. Give compensation, see next section

VI. Compensation
   a. Thank participant for their time
   b. Give the compensation
   c. Open the receipts page of the binder
   d. Give the envelope to the participant and ask them to initial the receipt
   e. Initial the receipt page
   f. Paper clip the provider's documents together on the right long side and place them in the binder behind the "complete" tab
   g. Initial the compensation box on the Recruitment Log on the line for that participant

VII. Post-Interview
   a. Check that survey has been entered into Survey Gizmo successfully
      i. Username: michelle.henkhaus@emory.edu
      ii. Pw: [[password redacted]]
      iii. Click on Survey "HIV Retention Care survey – Final"
      iv. In Results tab at the top, click on "Individual Responses"
      v. Most recently submitted survey should be at the top, you can click to look at the survey with answers that were submitted
   b. Make sure you have all materials before leaving your current location:
      i. Badge
      ii. Study lab coat
      iii. 2 e-recorders
      iv. Extra batteries
      v. Incentives not used (for survey or IDI)

vi. Receipt form
vii. Study tablet and charger
viii. Mobile hotspot device if applicable
ix. Pen
x. Notepad
xi. Signed survey consent, IDI consent if applicable, locator form, copy of survey, copy of IDI guide, copy of study protocol

c. Bring informed consent and locator forms to locked filing cabinet in Dr. Kalokhe's office at Emory University Hospital Midtown tablet within 1 business day of appointment
d. Return all study materials to the Ameeta's office within 24 business hours of your interview (Carla Bailey [[contact information]]; Khaleelah Muwwakkil [[contact information)
e. Indicate on the scheduling calendar that you have completed the interview and given compensation
f. Count the number of cash envelopes remaining in the cash box
g. Make sure none are missing
h. Update and initial the compensation log
i. Ensure the tablet, phone and e-recorders have enough charge for the next GRA's interview
j. Make sure you have retrieved your personal items and lock the filing cabinets
k. Return the filing cabinet keys to Ameeta's desk

Study Protocol: In-Depth Interview

I. Pre-Interview
   a. GRAs to check inbox and appointment schedule each week
      i. 24-hours prior to study visit GRA to confirm time/location with participant.

Reminder call script – ***Have participant name and Birthdate available***
Hi, may I please speak to (PATIENT NAME)?

Hi my name is (_____) and I'm calling from Emory, How are you today? (Allow time for response)

Before we start, can you confirm your birthday to ensure that I am speaking to the right person?
(Confirm Birthday)
(if patient is not there do not tell the person on the line any more information but tell them you will call back later to reach them)

Thank you (PATIENT NAME). I am calling to just remind you of the appointment you have on (APPOINTMENT DAY) to complete the patient interview on staying in care at

the Emory clinic. We have your appointment scheduled for (TIME) on (APPOINTMENT DAY) at (LOCATION). Does this day, time, and location still work for you?

(If yes)
Great, thank you for confirming that. We look forward to seeing you then.

(If yes and location is at Emory Midtown)
Great, thank you for confirming that. A member of our study team will meet you in the lobby of Emory Midtown Hospital at the patient services desk in the main lobby by the bottom of the escalators at (appointment time). We will be wearing a gray lab coat, and if you have trouble finding us you can call [study phone number].

(If no)
Ok, no problem, we would be happy to reschedule a better time for you. What day or time would work better?

Would you like to meet at the same location as before?

Great, I now have you scheduled for an appointment _____.

If you have any questions before the appointment, please feel free to call us at [study phone number]
Good bye.

b. Items to take to the interview:
    i. Parking pass (if at clinic)
    ii. Badge (if at clinic)
    iii. Pen
    iv. Note pad
    v. Complete interview appointment information
    vi. 2 E-recorders
    vii. Extra batteries
    viii. Incentive
    ix. Receipt book
    x. 2 copies of consent form
    xi. Locator form
    xii. Back-up paper versions of the interview guide
    xiii. Back-up copies of protocol
    xiv. Mobile hotspot

II. <u>Set-Up (the visit and/or compensation visit)</u>
    a. Business casual clothing should be worn
    b. Ensure all your personal belongings and the study materials (including tablets and recorders) are always either locked (in 6th floor cabinet in Ameeta's office at RSPH or in Ameeta's 11th floor office at EUHM) or with you. **Do not leave personal items or study materials unattended.**

c. The primary location for interviews will be Emory Midtown clinic, but upon request, interviewer may schedule to meet participant at a mutually convenient place appropriate for study visit. (*See section III for additional set-up dependent on interview location)*

III. Set-Up Based on Interview Location

a. At clinic
    i. Arrive to interview 60 minutes early
    ii. Lock personal belongings in Ameeta's 11th floor office, Alan can provide access
    iii. Bring all study materials with you and meet patient in the lobby at the patient services desk
    iv. Once patient arrives, bring patient to interview room
b. At participant home (note: 2 GRAs should attend an offsite appointment and Ameeta should be notified)
    i. Upon arrival confirm name and DOB with participant
    ii. Ensure the location has privacy (no others are around)
    iii. If location appears inappropriate to conduct visit, assess the participants willingness to reschedule *(See Recruitment section III for additional information on scheduling appointments*)
c. At neutral location (note: 2 GRAs should attend an offsite appointment and Ameeta should be notified)
    i. Ensure that location has privacy (ex: if at coffee shop, go to a more secluded/private area)
        1. If interview is interrupted or is no longer private, prompt an unrelated conversation with participant
    ii. Prepare recorder and consent form, check mobile Wi-Fi connection
    iii. If location appears inappropriate to conduct visit, assess the participants willingness to reschedule *(See Recruitment section III for additional information on scheduling appointments*)

IV. Conducting the Interview

a. Introduce yourself and begin building rapport
    i. If conducting interview directly after survey, explain to participant that you are transitioning into another portion of the study visit
b. Read the introduction of the interview guide, conduct informed consent
c. Offer copy of informed consent and notify them that there is potentially sensitive information about HIV on the document
d. Explain that you will be audio-recording but that there will be no identifiable information in the resultant transcripts (consent form)
e. Use the provided interview guide to conduct of the interview
f. Take notes as needed

V. Compensation

a. Thank the participant for their time

b. Open the receipts page of the binder
c. Give the compensation envelope to the participant and ask them to initial the receipt
d. Initial the receipt page
e. Thank the participant for their time and ask if they would like any referrals
    i. If yes, refer them to Alan Bailey
f. Paper clip the provider's documents together on the right long side and place them in the binder behind the "complete" tab
g. Initial the compensation box on the Recruitment Log on the line for that participant.

VI. Post-Interview

a. Make sure you have all materials before leaving your current location:
    i. Badge
    ii. Study lab coat
    iii. 2 e-recorders
    iv. Extra batteries
    v. Incentives not used (for survey or IDI)
    vi. Receipt form
    vii. Study tablet and charger
    viii. Mobile hotspot device if applicable
    ix. Pen
    x. Notepad
    xi. Signed survey consent, IDI consent if applicable, locator form, copy of survey, copy of IDI guide, copy of study protocol
b. Make sure you have retrieved your personal items and lock the filing cabinet.
c. Bring informed consent and locator forms to locked filing cabinet in Dr. Kalokhe's office at Emory University Hospital Midtown tablet within 1 business day of appointment
d. Return all other study materials to the research office (Ameeta's office at RSPH) within 24 business hours of your interview
e. Indicate on the scheduling spreadsheet that you have completed the interview and provided appropriate compensation
f. Count the number of cash envelopes remaining in the cash box
g. Confirm that no cash envelops are missing
h. Update and initial the compensation log
i. Ensure the tablet and e-recorders have enough charge for the next GRA's interview
j. Return all study materials to the filing cabinet
k. Make sure you have retrieved your personal items and lock the filing cabinets
l. Return the filing cabinet keys to locked cabinet in Ameeta's desk