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# Pilot Findings From the First Legalized Mobile Retail Pharmacy Clinic in the United States for Infectious Disease Treatment and Prevention Tailored to Reach People Who Use Drugs

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***Background.*** Mobile retail pharmacies were legalized in Connecticut in 2023 to provide primary care, human immunodeficiency virus (HIV) and hepatitis C virus (HCV) testing, preexposure prophylaxis (PrEP), immediate HIV antiretroviral therapy (ART), and medications for substance use disorders directly to people who use drugs (PWUD).

***Methods.*** InMOTION mobile pharmacy and clinic (MPC) pilot findings describe services provided by pharmacists, clinicians, and community health workers.

***Results.*** From 13 December 2023 through 5 November 2024, the MPC engaged with 414 participants, of whom 43% were female, 26% Black/African American, 32% uninsured, and 37% unhoused or unstably housed. Fifty-one had a previous diagnosis of an opioid use disorder (OUD), 163 accepted screening, 1 received a new diagnosis of moderate to severe OUD, and 37 received medication for OUD. Nine participants requested sexually transmitted infection testing; 3 people had positive results, all were prescribed treatment, and 1 received doxycycline postexposure prophylaxis. Four people had existing HIV diagnoses; 166 accepted rapid point-of-care (POC) testing, resulting in 1 positive test; all received ART (2 oral, 3 injectable); 9 who tested HIV negative accepted PrEP, and 1 accepted the injectable formulation. Twenty-two had known HCV, 157 accepted rapid POC HCV testing, 9 tested positive for HCV antibodies, and 11 underwent HCV viral load (VL) testing; 1 self-cleared, and 8 of 10 with detectable HCV VL received direct-acting antivirals from the MPC. Six were treated for xylazine-related wounds.

***Conclusions.*** Health services delivered through an MPC demonstrate the potential to address healthcare gaps for PWUD and warrant exploration and expansion.

**Keywords.** HCV; HIV; mobile pharmacy; PrEP; substance use disorder.

Substance use, including opioids, stimulants, and alcohol use, is associated with an increase in the transmission and acquisition of human immunodeficiency virus (HIV) and hepatitis C virus (HCV) infections via associations with sharing injection drug use works as well as condomless sexual intercourse [1, 2]. Substance use harm reduction strategies and treatment have been pivotal in the reduction of HIV acquisition and risk behaviors [3]. People who use drugs (PWUD) face elevated risks of multiple bacterial infections, including skin and soft tissue infections, bacteremia, infective endocarditis, and osteomyelitis, as well as sexually transmitted infections (STIs) [4, 5].

The intersection of infectious diseases and substance use disorders (SUDs) significantly increases morbidity and mortality among PWUDs [6], who frequently experience multiple concurrent infections and are more likely to have mental health comorbidities [7]. Harm reduction strategies—including syringe service programs (SSPs), safe injection facilities, treatment for opioid, alcohol, and stimulant use disorders (OUD, AUD, and StUD, respectively), and mental health resources—are necessary for improving health outcomes. However, throughout their healthcare journey, PWUDs face a cascade of challenges with prevention, treatment initiation, and retention [8–11].

Mobile health services, such as mobile health clinics (MHCs), bridge these geographical and economic gaps by bringing care directly to underserved communities [12]. MHCs have successfully engaged PWUD in accessing medication for OUD (MOUD) by providing a stigma-free, patient-centered

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environment [13]. When PWUDs overcome transportation barriers and access a facility, they frequently encounter psychosocial barriers, such as stigma and racism, which contribute to their mistrust of the healthcare system [14, 15] and significantly impede effective medical engagement.

Medication and pharmacy access constitute a final, often-overlooked barrier for PWUD. Even when individuals receive prescriptions for MOUD, HIV preexposure prophylaxis (PrEP), antiretroviral therapy (ART), mental health, and other comorbidities, or referrals for HIV testing and harm reduction within integrated care models, they must navigate a separate and equally complex pharmacy system. This involves finding a pharmacy that stocks medication for overdose prevention, SUD treatments, HIV treatment or prevention, and sterile syringes [16]. However, studies reveal significant variation in access to MOUD through pharmacies. For example, 1 in 5 pharmacies will not stock or dispense buprenorphine; of those, only 41% have both naloxone and buprenorphine readily available [17, 18]. Additionally, biased attitudes and beliefs among pharmacy staff contribute to limited harm reduction support; many are unwilling to sell syringes to PWUD despite their proven benefits in reducing harm and preventing infectious diseases [19]. Moreover, even in jurisdictions where pharmacies are authorized to prescribe and dispense HIV PrEP or post-exposure prophylaxis (PEP), only 8% of pharmacies provide these services [20], thus adding additional barriers to effective HIV prevention strategies and creating a missed opportunity for HIV prevention in a group of persons engaging in high-risk behaviors [13].

To truly incorporate a patient-centered approach, integrated care models must include pharmacy access as a core component to ensure immediate and equitable access to life-saving medications and services [10, 21]. To address these systemic challenges, our study introduces an innovative mobile retail pharmacy and clinic (MPC) model, the first of its kind in the United States (US). This model deploys a multidisciplinary team of clinicians, pharmacists, and community health workers (CHWs) who directly provide integrated clinical and pharmacy care to PWUD in high-overdose communities [10]. It eliminates transportation barriers and delivers stigma-free care by meeting patients where they are—whether in encampments, shelters, or other underserved locations.

## METHODS

### Overview of the Mobile Retail Pharmacy

The InMOTION (Integrated Mobile Opioid Treatment and Infectious Disease Coordinated Care in Your Neighborhood) MPC is a novel hub-and-spoke model integrating retail pharmacy and MHC services for PWUD conceived of by one of the authors (S. A. S.) and funded by the National Institute on Drug Abuse [10]. This intervention was made possible by legislation in the state of Connecticut (CT), Senate Bill 1102 (An Act Concerning Pharmacies and Pharmacists), which legalized mobile retail pharmacies [22] and authorized pharmacists in CT to test for HIV and dispense HIV treatment with ART or PrEP if the test is negative. Building on this foundation, Senate Bill 133 was passed in CT on 28 May 2024, allowing pharmacy technicians also to conduct HIV testing [23].

The MPC team includes a clinician, a driver, a pharmacist, 3 CHWs, and a medical technician trained in phlebotomy who also functions as a CHW on the MPC. The CHWs mitigate stigma by interacting with the community to assess social determinants; provide OUD/SUD screening, rapid HIV and HCV testing, and noncommunicable disease assessments (eg, blood pressure, finger-stick blood glucose evaluations); and facilitate real-time linkage to clinicians in person on the MPC or via telehealth or referral to local, brick-and-mortar community clinics [24].

The pharmacist on the MPC dispenses medications after receiving electronic prescriptions submitted through telehealth or by MPC clinicians on-site, as well as other licensed providers in the community. The pharmacy stocks medications for many medical conditions, including antibiotics, vaccines, PEP, HCV treatment, STI prevention (doxycycline PEP [Doxy-PEP]) and treatment, naloxone, MOUD, and ART and PrEP (including injectable formulations). The pharmacist collaborates with clinicians and CHWs to arrange follow-up care and refills. Figure 1 provides an overview of the MPC operations.

### Study Design and Participants

The preliminary pilot results from this cross-sectional analysis utilize data from the InMOTION team. Participants were enrolled from areas of CT with a high need for medical and social services, including the towns of Waterbury, Norwich, and New Haven, between 13 December 2023 and 5 November 2024. Descriptive data analysis of the demographic information and services utilized was done using Microsoft Excel (version 16.85) and RStudio software [25].

### Patient Consent Statement

This project's activities and protocols were reviewed and approved by the Yale University Institutional Review Board (numbers 2000036289 and 2000031991). A waiver for written informed consent was approved. Participants were not paid for their participation in this project.

### Measures

Measures included demographic characteristics, medical and substance use–related screening, and service utilization, including physical examination, laboratory diagnostics, and prescription data. Biological testing included Clinical Laboratory Improvement Amendments–waived rapid HIV [26] and HCV [27] antibody tests. Moderate to severe opioid and stimulant

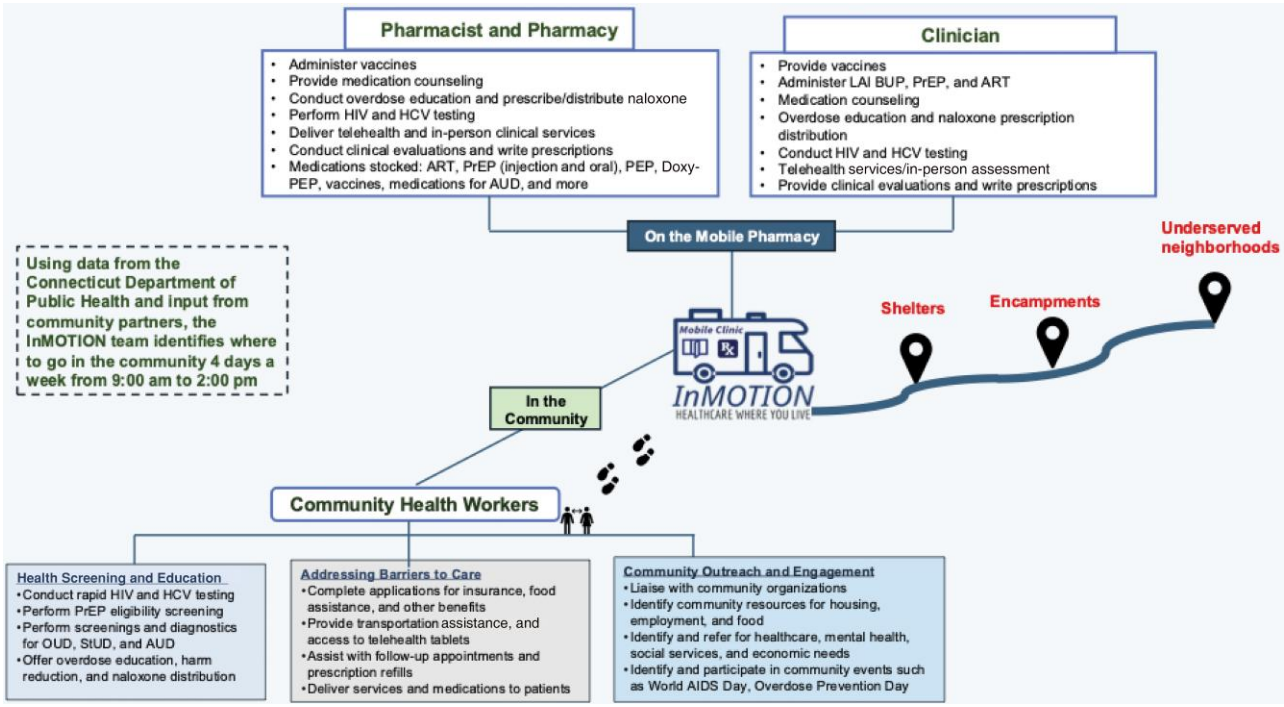


**Figure 1.** InMOTION project design. Abbreviations: ART, antiretroviral therapy; AUD, alcohol use disorder; Doxy-PEP, doxycycline postexposure prophylaxis; HCV, hepatitis C; HIV, human immunodeficiency virus; InMOTION, Integrated Mobile Opioid Treatment and Infectious Disease Coordinated Care in Your Neighborhood; LAI BUP, long-acting injectable buprenorphine; OUD, opioid use disorder; PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis; StUD, stimulant use disorder.

use disorder diagnoses were assessed using the Rapid Opioid and Stimulant Use Disorder Assessments (ROUDA and RSUDA) [28], and alcohol use disorder was assessed via the Alcohol Use Disorder Identification Test (AUDIT) [29]. Medical history was collected through self-report and verification through the Yale New Haven Health System electronic medical record system (EPIC). Real-time data collection was recorded using REDCap (Research Electronic Data Capture) [30].

## RESULTS

During the first 11 months of the project, 414 people engaged in services with the InMOTION team (CHWs, clinical staff, and/or the pharmacist) for 543 medical appointments. Of these appointments, 85% (463) were in person, and the remaining 15% (85) of visits were via telehealth. Of the 414 persons, 43% identified as women, 26% were Black/African American, 45% identified as Hispanic, 32% were uninsured, and 37% were unhoused or unstably housed. Of the 283 who responded to items regarding their previous healthcare system engagement (an item added later to the database), 9% were never tested for HIV, and 32% were tested for HIV >1 year ago (Table 1).

Of the 414 persons who engaged with the InMOTION team, 4 (1%) had a previous HIV diagnosis, 166 (41%) accepted rapid HIV testing, and 1 (1%) had a new HIV diagnosis. Of these 5 individuals with HIV, all received HIV treatment (ART) from the MPC. Of them, 3 (60%) received injectable cabotegravir and rilpivirine for ART. Of the 161 (97%) who tested negative for HIV, 9 (6%) accepted PrEP, with 1 (11%) who received injectable cabotegravir. Of the 414 persons who engaged with the InMOTION team, 22 (5%) persons had a previous diagnosis of HCV. Additionally, 157 (40%) persons without a previous diagnosis accepted rapid point-of-care HCV antibody testing, and 9 (6%) received new HCV diagnoses. Of the 31 patients with a new or previous diagnosis, 11 underwent HCV confirmatory testing on the same day of HCV antibody testing or the first day of the visit, with 2 (18%) people who self-cleared the infection, while of the 9 of 11 (81%) who had active infection noted by a detectable viral load (VL), 8 of the 9 (89%) were initiated on direct-acting antivirals (DAAs) within an average of 4 days since testing, with a majority (5/8 [63%]) starting same-day treatment. Follow-up showed that 2 (25%) cleared, 1 (13%) did not clear, and 5 (63%) were incarcerated or in 90-day substance use treatment programs. Therefore, their sustained virological response is unconfirmed.

Of the 9 (2%) patients who expressed concern about possible exposure to an STI, all received testing, 33% (n = 3) were prescribed treatment from the mobile pharmacy, and 11% (n = 1) received postexposure STI medication (Doxy-PEP) from the MPC (Table 2). Of the patients who engaged with the InMOTION team, 51 (24%) had a previous diagnosis of OUD, and 163 (45%) were screened for OUD using ROUDA.

**Table 1. Characteristics of Patients Utilizing Integrated Mobile Opioid Treatment and Infectious Disease Coordinated Care in Your Neighborhood (InMOTION) Services (N = 414)**

| Patient Characteristic | No. (%) |
|---|---|
| Gender | |
| Male | 225 (54.3) |
| Female | 179 (43.2) |
| Transgender | 3 (0.7) |
| Not reported | 7 (1.7) |
| Age, y, mean (median) | 48.7 (49.1) |
| Race | |
| White | 180 (43.5) |
| Black/African American | 108 (26.1) |
| Multiple races | 36 (8.7) |
| Other | 9 (2.2) |
| Unsure/refused/not reported | 81 (19.6) |
| Hispanic | |
| Yes | 188 (45.4) |
| No | 210 (50.7) |
| Not reported | 16 (3.9) |
| Housing status | |
| Stably housed | 231 (55.8) |
| Unstably housed | 59 (14.3) |
| Unhoused | 95 (22.9) |
| Not reported | 29 (7.0) |
| Covered by health insurance (can select multiple) | 257 (62.1) |
| None | 133 (32.1) |
| Private insurance | 46 (11.1) |
| Medicare | 28 (6.8) |
| Medicaid | 204 (49.3) |
| Not reported | 24 (5.8) |
| Engagement with the healthcare system | |
| Most recent HIV testing (n = 283) | |
| Tested within the last 12 mo | 80 (28.3) |
| More than 1 y ago | 91 (32.2) |
| Never tested before | 26 (9.2) |
| Don't remember | 87 (30.7) |

Abbreviations: HIV, human immunodeficiency virus.

One (1%) new moderate to severe OUD diagnosis was made. Of the 51 previously diagnosed and the 1 new diagnoses of OUD, 41 (80%) were prescribed a form of MOUD, 31 (76%) were on methadone, 5 (12%) were on the sublingual formulation of buprenorphine, and 1 (2%) was on the injectable formulation of buprenorphine. Of those on MOUD, the person receiving the injectable buprenorphine and 4 of the 5 receiving sublingual buprenorphine were prescribed these medications from the clinician on the MPC. Furthermore, 24 (6%) had a previous diagnosis of AUD, and 147 (38%) of persons who engaged with the MPC accepted screening for AUD, resulting in 6 (4%) new moderate to severe AUD diagnoses. Of the 30 persons with previous or new diagnoses of AUD, 11 (37%) were prescribed a medication from the MPC clinician to treat their AUD and dispensed by the pharmacist from the InMOTION mobile pharmacy; 6 (55%) received oral naltrexone, 3 (27%) received extended-release injectable naltrexone, and 2 (18%) received acamprosate. Additionally, 27 (7%) had a previous diagnosis of StUD, and 175 (45%) accepted screening for StUD. Of those screened, 10 (7%) had a new diagnosis of moderate to severe StUD and were referred for behavioral treatment in the community.

Additional services for PWUD that were utilized included wound care, referral for SSP services, fentanyl test strips, xylazine test strips, overdose education, and naloxone distribution. A total of 35 people accepted and received overdose education and naloxone distribution, of which 24 patients received 31 boxes of naloxone from the CHWs, and 11 people received 13 boxes of naloxone from the MPC pharmacy as a prescription. Additionally, 15 people were provided fentanyl test strips, and 18 people received xylazine test strips.

## DISCUSSION

The InMOTION mobile pharmacy clinic is the United States' first legal MPC that integrates on-site pharmacy services with clinical care to people where they live. These pilot findings demonstrate the potential of a fully integrated healthcare model to address the intersection of SUD, infectious diseases, and social determinants of health in a single mobile platform that goes to communities with a high need for harm reduction services. The MPC successfully engaged a diverse population often underserved by traditional healthcare systems. The MPC team was able to reach people who were unhoused or unstably housed, uninsured, and with diverse gender, ethnic, and racial backgrounds. In this model, individuals engage with the CHWs in the community who offer screenings for HIV, HCV, STIs, and SUDs, as well as active linkage to social services. Individuals were also provided harm reduction tools, including overdose education and naloxone, as well as fentanyl and xylazine test strips. Individuals were offered clinical care on the MPC for medical exams and a full pharmacy to receive prescriptions on the same day. This model of care offers the opportunity to reduce barriers on an individual level and fill gaps at a community level.

While acceptance of infectious disease and substance use–related screenings were high, with approximately 40% screened for HIV and HCV, 45% for OUD, 28% for AUD, and 45% for StUD, the InMOTION MPC identified a modest number of diagnoses for HIV (n = 5 [1.2%]), STIs (n = 9 [2.2%]), and HCV (n = 29 [7.0%]) during its 11-month pilot. Nonetheless, the ongoing prevalence of these infections signals continuous opportunities for testing, diagnosis, treatment, and prevention. For example, in the US in 2022, the prevalence rate in the US of HIV infection was 0.3% [31], the HCV prevalence was 0.9% [32], and the prevalence of STIs was about 0.7%, consisting of 2.5 million infections of chlamydia, gonorrhea, and syphilis [33]. In addition to being able to reach and engage with this population, the MPC provides whole-person care, treating

**Table 2. Testing and Treatment of Infectious Diseases or Substance Use Disorders (N = 414)**

| Biological Testing and Health Screenings | No. (%)[a] |
|---|---|
| HIV testing | |
| Previous HIV diagnosis | 4 (1.0) |
| Received rapid HIV testing (n = 410) | 166 (40.5) |
| New HIV diagnosis (n = 166) | 1 (0.6) |
| Received ART treatment from MPC (of those with new or existing HIV diagnosis; n = 5) | 5 (100.0) |
| Injectable ART (n = 5) | 3 (60.0) |
| Received PrEP (n = 409) | 9 (2.2) |
| Injectable PrEP (n = 9) | 1 (11.1) |
| Hepatitis C testing | |
| Previous HCV diagnosis | 22 (5.3) |
| Received rapid HCV testing (n = 392) | 157 (40.1) |
| New HCV diagnosis (n = 157) | 9 (5.7) |
| Underwent HCV viral load testing (n = 31) | 11 (35.5) |
| HCV viral load detectable (n = 11) | 9 (81.2) |
| Self-cleared (n = 11) | 2 (18.2) |
| Received DAA treatment from the MPC (of those with existing HCV or new diagnosis; n = 9) | 8 (88.9) |
| Sexually transmitted infections | |
| Reported exposure to STI | 9 (2.2) |
| Tested for STI (n = 9) | 9 (100.0) |
| Positive STI test (n = 9) | 3 (33.3) |
| Prescribed treatment for STI after testing (n = 3) | 3 (100.0) |
| Received postexposure STI treatment (Doxy-PEP; n = 9) | 1 (11.1) |
| Vaccinations | |
| Persons who received vaccinations on the MPC | 38 (9.2) |
| Influenza vaccine (n = 38) | 19 (50.0) |
| Shingles vaccine | 20 (52.6) |
| Pneumonia vaccine (n = 38) | 8 (21.1) |
| Received vaccination for HBV (n = 38) | 4 (10.5) |
| Received full Heplisav-B series (n = 4) | 2 (50.0) |
| Initiated Twinrix series (n = 4)[b] | 2 (100.0) |
| Opioid use disorder | |
| Previous OUD diagnosis | 51 (23.8) |
| Screened for OUD (n = 363) | 163 (44.9) |
| No history of opioid use (n = 163) | 158 (96.9) |
| New diagnosis for moderate to severe OUD (n = 163) | 1 (0.6) |
| MOUD from other providers (n = 52) | 37 (71.2) |
| Methadone (n = 52) | 31 (59.6) |
| Injectable buprenorphine (n = 52) | 1 (1.9) |
| Sublingual buprenorphine (n = 52) | 5 (9.6) |
| Prescription of sublingual buprenorphine from MPC team (n = 52) | 4 (7.7) |
| Prescription of injectable buprenorphine from MPC team (n = 52) | 1 (1.9) |
| Stimulant use disorder | |
| Previous StUD diagnosis | 27 (6.5) |
| Screened for StUD (n = 387) | 175 (45.2) |
| No history of stimulant use (StUD) (n = 175) | 152 (86.9) |
| New diagnosis for moderate to severe StUD (n = 175) | 10 (6.6) |
| Alcohol use disorder | |
| Previous AUD diagnosis | 24 (5.8) |
| Screened for AUD (n = 390) | 147 (37.9) |
| No history of alcohol use (n = 147) | 121 (82.3) |
| New diagnosis for moderate to severe AUD (n = 147) | 6 (4.1) |
| On mediation for AUD from MPC (n = 30) | 11 (36.7) |
| Oral naltrexone (n = 11) | 6 (54.5) |
| Extended-release naltrexone (n = 11) | 3 (27.3) |
| Acamprosate (n = 11) | 2 (18.2) |
| Harm reduction | |
| Overdose education and naloxone distribution | 35 (8.5) |
| OEND via community health worker (n = 35) | 24 (68.6) |
| OEND via prescription from mobile pharmacy (n = 35) | 11 (31.4) |
| Referral to syringe service program | 1 (0.2) |
| Provided fentanyl strips | 15 (3.6) |
| Provided xylazine strips | 18 (4.3) |
| Substance use–related wound care | 6 (1.4) |

Abbreviations: ART, antiretroviral therapy; AUD, alcohol use disorder; DAA, direct-acting antiviral; Doxy-PEP, doxycycline postexposure prophylaxis; HBV, hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus; MPC, mobile pharmacy clinic; MOUD, medication for opioid use disorder; OEND, overdose education and naloxone distribution; OUD, opioid use disorder; PrEP, preexposure prophylaxis; STI, sexually transmitted infection; StUD, stimulant use disorder.

[a]N = 414 unless otherwise indicated.

[b]Treatment still in progress.

conditions with the latest medical guidelines in a timely fashion. Additionally, the MPC provides guideline-recommended concurrent HIV and STI [34] prevention and treatment, identifies individuals who might have otherwise remained undiagnosed, and provides immediate treatment, decreasing the likelihood of transmission and preventing complications. With an on-site pharmacy, the MPC pharmacist and clinician collaborate to provide immediate access to novel therapies that patients may not be aware of or have timely access to. For example, 1 patient was able to start Doxy-PEP in July, a month after the new medication recommendation was issued by the Centers for Disease Control and Prevention to be taken within 3 days (or 72 hours) after sex to help reduce the chances of acquiring syphilis, chlamydia, and gonorrhea [35].

This MPC model of care is not only able to engage, identify, and test individuals with high rates of infectious diseases and substance use, but the data from this pilot show that the MPC team can also increase treatment rates. For example, among individuals with HCV, those who engage with the MPC are more likely to initiate treatment. The data from this pilot show that 89% of persons with detectable HCV VL initiated DAA treatment, compared to the national average of 23% among persons with Medicaid insurance [36]. Furthermore, a 100% HIV treatment rate among a modest sample of those with HIV who engage with the MPC team has the potential to contribute to the Healthy People 2030 goal to get 95% of people with HIV on treatment to have an undetectable VL to reduce HIV transmission as part of the End HIV Epidemic goal [37], by initiating persons with HIV onto ART on the same day and providing injectable formulations of ART. Additionally, this model addresses the limitations of traditional

pharmacy settings in providing HIV care. For example, retail pharmacists providing HIV care have identified that achieving sustained viral suppression requires more than just providing ART. Achieving and maintaining viral suppression among people with HIV also requires addressing social needs like food insecurity, homelessness, and other social determinants of health that traditional retail pharmacies are unable to address independently [38, 39]. CHWs within the model are key in overcoming these barriers and linking patients to resources to address their unmet needs. Future research should explore collaborative care models that integrate pharmacists into mobile teams and assess their long-term sustainability and scalability in improving medication access to care for underserved populations.

This study has several limitations. First, the study lacks a control group, which limits the ability to compare the outcomes of the MPC model to other care models. Second, the study was conducted across 3 communities in Connecticut, which may limit the generalizability of the findings to other regions or populations. Finally, the study's relatively short duration restricts the ability to assess the long-term sustainability and effectiveness of the MPC model.

## CONCLUSIONS

These are the early preliminary results of implementing the first legalized MPC in the US specifically created to help overcome barriers to help PWUD. We have identified that in the first 11 months of this program, it is viable to provide a 1-stop shop provision of healthcare and pharmacy services and that persons are accepting of HIV, HCV, and other infectious diseases testing, prevention, and treatment services along with SUD and harm reduction services. Health services through an MPC should be expanded to meet gaps in healthcare for PWUD.

### Notes

***Author contributions.*** S. A. S. received the funding; is the project's principal investigator; and contributed to the manuscript's conceptualization, design, development, and editing. A. T., C. A. F., A. D., A. M. S., and S. V. S. contributed to the design and implementation of the project, as well as the writing and editing of this manuscript. R. B. led the data management team and conducted the data analysis.

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***Data availability.*** Data are not publicly available.

***Disclaimer.*** The funder was not involved in the research design, analysis, or interpretation of the data or the decision to publish the manuscript.

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