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Treatment trajectories and barriers in opioid agonist therapy for people who inject drugs in rural Puerto Rico

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Abstract

Background: Research has shown medication for opioid use disorder (MOUD) to have positive effects, including reducing HIV and HCV transmission, but important barriers to access remain among people who inject drugs (PWID). Barriers include lack of social and familial support, bureaucracy, distance to treatment, poverty, and homelessness. However, we know little about how these barriers interact with each other to shape PWID's drug treatment access and retention.

Methods: We used qualitative methods with a dataset from a study conducted during 2019 with 31 active PWID residing in rural Puerto Rico. The study gathered ethnographic data and narratives about treatment trajectories to document the lived experiences of PWID as they moved in and out of treatment.

Results: Participants were at least 18 years old; 87.7% were male, the mean age was 44.1 years, and the mean age at first injection was 22 years. Participants identified homelessness, lack of proper ID or other identifying documents, and previous negative experiences with MOUD as the main barriers to treatment entry and retention. In addition, PWID's belief that MOUD simply substitutes an illegal drug for a legal one, while furthering drug dependence by chronically subjecting patients to treatment, constitutes an additional barrier to entry. Findings from this study demonstrate that MOUD barriers to access and retention compound and are severely affected by poverty and other forms of vulnerability among PWID in rural Puerto Rico.

Conclusion: Policies to increase access and retention should consider barriers not in isolation but as an assemblage of many factors.

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Contributors

RA conceived the study, oversaw data collection, and wrote the first draft of the manuscript. KM and KD read the first manuscript and made substantial revisions. PH conducted the statistical analysis. All authors read and approved the final manuscript.

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Keywords

Opioid Agonist Therapy; barriers; PWID; treatment trajectories; Puerto Rico; rural

1. Introduction

Research has found medication for opioid use disorder (MOUD) employing methadone maintenance therapy (MMT) or buprenorphine maintenance therapy (BMT) to have multiple positive effects, including reducing patients' illegal activity, drug use frequency, HIV risk behaviors, hepatitis C (HCV) transmission, and overdose episodes (Altice et al., 2011; Magura, Rosenblum, & Rodriguez, 1998; Mlunde et al., 2016; Nolan et al., 2014; Palepu et al., 2006; White et al., 2014). However, these benefits can only be attained if prospective patients enroll in and adhere to treatment. People who inject drugs (PWID) face multiple individual, institutional, and structural barriers to MOUD access and retention, which have been well-documented in a number of settings from North America, Europe, and Australia.

At the individual level, a study of MMT initiation among polysubstance users in Vancouver, Canada, showed that participation in the sex trade and recent incarceration reduced the likelihood of treatment uptake. Involvement with the criminal justice system may also diminish retention in MOUD; individuals with a history of arrest had significantly shorter treatment experiences than those without (Awgu, Magura, & Rosenblum, 2010). Negative beliefs about methadone treatment (and the larger cultural stigma around substance use they reflect) constitute additional barriers to patients' enrollment (Bojko et al., 2015; Gelpi-Acosta et al., 2014; Varas-Dias et al., 2010). Finally, research has found physical distance from an MOUD program to be a good predictor of treatment interruption (Rosenblum et al., 2011; Wu et al., 2013).

At the institutional level, MOUD access and retention are limited by bureaucratic norms and procedures. A waiting list might delay or discourage treatment, constituting a potential barrier (Redko, Rapp, & Carlson, 2006). Research conducted by Moore (2009) among service providers and PWID enrolled in a methadone clinic in Australia pointed to disagreements over the clinic's rules as one of the main causes of treatment interruption. While (longer) time in MOUD is associated with improved participant outcomes, side effects of methadone might prevent enrollment or hinder treatment adherence, a barrier also identified elsewhere (Kerr et al., 2005; Lovejoy et al., 1995). Structural barriers to MOUD initiation and retention include homelessness (Petrson et al., 2010), lack of health insurance or a picture identification document (VanHandel et al., 2016), and, perhaps most salient to the current study, geographic location (Cummings, Wen, Ko, & Druss, 2014).

In rural parts of the United States, the recent shift from illicit use of prescription opioids to intravenous drug use has reached epidemic levels, creating new demands for treatment (Abadie & Dombrowski, 2020). Such a spike in need amid a scarcity of resources underscores the urgency of understanding the barriers to and facilitators of MOUD treatment in rural areas to maximize coverage (Lopez et al., 2015; Browne et al., 2016). Arguably, the gap between supply and demand is most severe in Puerto Rico, where the public health

infrastructure related to substance abuse is severely lacking relative to need (Colon et al., 2006).

Infrastructural deficits are reflected in alarmingly high rates of morbidity and mortality among PWID. The island hosts one of the highest incidences of HIV and HCV infection in the United States, with a significant proportion of those infections coming from drug use (Abadie et al., 2017). In recent surveillance data, more than 20% of new HIV diagnoses in Puerto Rico were attributed to injection drug use (compared to 8.3% in the continental United States), and more than 80% of current PWID in rural Puerto Rico were found to be infected with HCV (Abadie et al., 2016).

Drawing on qualitative data, this paper describes barriers to MOUD access and retention among PWID in rural Puerto Rico, a problem that has not been studied before, perhaps due to the difficulties of accessing this marginalized population. In so doing, this study fills a gap in the literature, which has relied for the most part on the study of barriers to MOUD concentrated in urban settings. In a departure from social-epidemiological analyses that consider barriers in isolation, we present treatment trajectory narratives that depict how individual, institutional, and structural barriers to MOUD compound as patients aim to enact their treatment strategies. Participants' narratives illuminate the obstacles faced when entering and remaining in MOUD and depict experiences of how these barriers are navigated. Additionally, we consider how policies might integrate these findings to overcome barriers to MOUD access and retention.

2. Methods

2.1 Study design

This study was embedded in a large multiphase study of the effects of Hurricane Maria on MOUD access and retention. We conducted the study among PWID residents in Cidra, Comerio, Aguas Buenas, and Cayey, four rural towns in the mountainous area of central Puerto Rico, about 30–40 miles from San Juan. In the first phase of the study, we used respondent driven sampling (RDS) to recruit a sample (N=177) of active PWID 18 years of age or older who reported having injected drugs within the past 30 days. RDS has proven effective at recruiting hard to reach populations (Heckathorn, 2002).

2.2 Measures

Research staff administered a survey about barriers to MOUD to participants. In addition, this tool collected data about participants' sociodemographic background and mental health status. The study assessed HIV and HCV status through the use of INSTI Rapid HIV antibody tests (Biolytical Laboratories) and OraQuick HCV Rapid antibody tests (OraSure Technologies).

Data presented in this paper are based on a subset of this population. Using a convenience sample, research staff asked study participants (N=31) to complete a one-hour interview about their experiences accessing MOUD. Sample selection included those both in and out of MOUD, drawn from different sociodemographic backgrounds, and oversampled for

gender to make sure women were represented in our study—this last point providing important information about gender dynamics and MOUD barriers in rural settings.

Beyond producing significant observational and ethnographic data regarding drug injection practices, homelessness, and access to health care—all known barriers to treatment—researchers solicited detailed treatment trajectory narratives, wherein participants described their historical engagements with different modes of drug treatment. In eliciting treatment narratives, interviewers' questions drew participants' attention to barriers to MOUD access and retention. Treatment trajectories documented participants' previous engagements with MOUD (either in Puerto Rico or in the continental United States), treatment duration, and outcomes. In addition, these narratives, which in some cases cover decades of substance use and treatment trajectories, provided a first-person account of the lived experiences not only of MOUD but also the challenges participants faced in accessing and adhering to treatment. Collected in 2019, after Hurricane Maria, one of the most devastating natural disasters in Puerto Rican history, the narratives document participants' experiences of navigating complex bureaucratic health systems (Harris, Rhodes, & Martin, 2013; Olsen, Banwell, & Dance, 2013) and point to the ways that individual, institutional, and structural factors operate to erect or reinforce preexisting barriers to treatment.

Research staff conducted analysis of the qualitative data derived from ethnographic field notes and treatment trajectory narratives using MAXQDA. The first author and two research assistants, working simultaneously and collaboratively, undertook the coding. The team used a code book to standardize coding procedures and to solve coding disagreements. The research team iteratively revised and regrouped these codes until they represented a set of higher-level axial codes describing participants' MOUD treatment experiences as well as barriers to access and retention. A posterior phase in data analysis used the codes produced in the first analytic phase to identify those treatment narratives that better represent typical treatment trajectories, providing a textured account of the multiple ways that barriers to MOUD entry and retention compound and shape treatment outcomes.

Participants received $40 as compensation for their time and efforts. The study received IRB approval from the University of Nebraska-Lincoln and the University of Puerto Rico. All names reported in the results are pseudonyms.

3. Results

3.1 Participant's sociodemographic background

Table 1 shows a side-by-side sample comparison. While both samples have a similar age composition (46 yrs), the qualitative sample contains a lower proportion of men (84%). Other differences between the samples are that the qualitative sample shows a higher proportion of homelessness in the past 12 months (42%) and a slightly higher proportion of unemployed (92%). In addition, this group declared a slightly higher level of income and a higher amount of daily drug purchases. There was no significant difference in educational attainment with six out of ten having a high school diploma or higher. Around half of the participants in both groups were currently enrolled in MOUD. Time since first injection was 25.3 years in the qualitative sample and only approximately two years earlier for those in the

full sample. Almost half of those in the qualitative sample reported injecting four times or more a day, while one in three injected with the same frequency in the other group. Finally, HIV prevalence was relatively low for both populations, but HCV has reached epidemic levels, with two out of three participants testing positive reactive (67%) in the full sample and more than nine in ten (94%) in the qualitative sample.

3.2 Treatment trajectories and barriers to MOUD

Participants' narratives of their treatment trajectories illustrate how individual biographical events, patterns of substance use, institutional policies, and structural forces shaped their decisions about seeking and remaining in MOUD. Condensing years and, in some cases, decades of interactions with MOUD programs, these narratives illustrate how poverty and, in particular, homelessness, lack of identification documents, difficulty accessing transportation, frequency of injection drug use, treatment preferences, previous negative experiences related to MOUD, and disagreements about bureaucratic rules governing MOUD contribute to and reinforce barriers to entry and retention in MOUD treatment.

This section presents the narratives of four people that showcase barriers to treatment uptake and retention. "Bebe," who had entered MMT treatment in the past year but was forced to abandon it due to transportation problems before resuming treatment after a life-threatening illness; "Dani mi Pai," who sought treatment in the past year, but was unable to enroll; "Josephine," who was enrolled in a methadone program for more than 10 years but struggled with the program requirements; and "José," who believed that MOUD is just another form of drug dependence and therefore preferred "detox" programs. While each narrative reflects participants' unique circumstances, when analyzed together, they paint a comprehensive picture of participants' experiences with MOUD in rural Puerto Rico and the barriers they face while seeking MOUD.

3.3 Bebe

Bebe, a skinny, charismatic, and energetic 40-year-old man, started injecting more than two decades ago. He identified "speedballs" (a blend of heroin and cocaine) as his drug of choice, using 10 or more times a day, sometimes spending nearly 100 USD a day, or "until the money is over." To afford his habit he hustled at a local gas station, running errands for the owner and approaching customers to offer car washing services. He also earned money as a "hit doctor" for PWID who have trouble finding a vein, charging a dollar or two per hit (or a cut of the drug), and a few times a week he also sold drugs at a *punto*, or drug-dealing spot, in local parlance.

"[I'm] fed up and tired of doing the same thing over and over," he said, to explain his decision to enter MMT a few months before Hurricane Maria. More frequent police presence at his *punto* had also made selling increasingly risky and buying unreliable. While Bebe had quit "*en frio*" or cold turkey during his stints in jail, he thought that it would be impractical to do so while on the streets because the temptation to use was just too strong. Instead, before enrolling in the methadone program he started cutting his drug use, progressively limiting his drug intake until it reached a manageable level. When he felt he was ready, he went to a treatment facility in metropolitan San Juan, as no programs existed

in the rural town where he lived. Since he had enrolled at this same site twice before, in 1997 and in 2007, they already had his file and could reopen his case immediately, avoiding any wait time, which can delay the process for weeks and even months. “They run everything on a computer now,” he marveled. Consulting the computer placed in the entrance allowed participants to learn whether they could get their methadone dose, had to take mandatory urine test, or were required to first see a “*social*” (social worker) due to a “stop” being placed on their file, resulting from a “dirty” urine test that detected cocaine, pills, or other forbidden substances. If everything went well, participants could walk away having taken their dose in less than 20 minutes.

Bebe was given a low dose of methadone and told to come back the next day. Taking a page from Narcotics Anonymous programs, he decided to take it “day by day,” saying, “today I won’t use.” Since methadone binds opioid receptors, he didn’t feel the need to use heroin; as he put it, “*el cuerpo no me la pide*” (my body didn’t ask me for it), even if his mind still craved the drug. Most of the time he managed to fend off his cravings, going to the treatment center very early in the morning and returning home immediately, to a nice house in a middle-class neighborhood, to relax and play with his dog. One of the challenges he faced during his trip to the methadone clinic was avoiding the drug bazaar that surrounds the entrance, where people traded all kinds of drugs, “cocaine, pills, everything,” he explained. Occasionally, he said, he “messed up” and injected.

Staff members frequently required unannounced urine tests and were particularly vigilant to make sure participants did not cheat by submitting somebody else’s “clean” urine. A series of negative results was richly rewarded; in return for compliance with program rules, participants were given take-home supplies in increasing weekly increments, up to one month. If the urine drug test found heroin, the study staff required participant to have a conversation with a social worker and medical staff, who could adjust the treatment. This usually resulted in a higher dose of methadone, under the assumption that a higher dose would better prevent a “relapse.” The presence of cocaine in the urine, however, triggered a different institutional response; instead of receiving an increased dosage, the treatment staff warned the participant that repeated cocaine use might result in program discharge.

Bebe never managed to secure a one-week methadone supply. A few months after entering the program, he quit. On one of the occasions he injected while enrolled in the program, he had a “*esquinazo*,” where he missed the vein and instead hit the muscle under his right knee. Pointing to a round scar the size of a quarter, he said, “it swelled to the size of a baseball,” and explained that it prevented him from walking to the pick-up point where he caught a public van to the treatment center. To avoid the painful methadone withdrawal symptoms, he started injecting speedballs immediately after quitting the program. He slowly built up his tolerance until he was “back into” his regular habit.

Although Bebe had been on methadone many times before, including a few months when he lived in Chicago, he had never enrolled in a buprenorphine program. “My body can’t assimilate it. My chest thuds, I have cold shivers and hot sweats, the weakness, vomiting, and diarrhea, all the same symptoms of heroin withdrawal,” he explained. He had obtained “*subu*” (as Suboxone is informally known) not through a formal treatment program but from

dealers who sold it on the street. This negative experience convinced him that buprenorphine treatment would not work for him.

After Hurricane Maria, Bebe continued his daily speedball habit until he was stricken with spinal pain so severe that he was unable to move for weeks. After being released from the hospital, he enrolled in MMT again. Although he struggled to get up from bed, he still fought his pain to buy his dose at the *punto*, usually after coming back from getting his methadone. Fed up with the pain and unable to find a suitable vein in his body after so many years of use, he decided to stick with the MMT program and stopped injecting. He had been on a low 30 mg dose and had not turned in dirty urine in months. His mother had a permit that allowed her to fetch his dose once a week, and Bebe hoped he would be able to receive a month's supply soon, to avoid his mother having to make weekly trips.

3.4 Dani mi Pai

While Bebe had a negative experience with street-procured Suboxone, Dani mi Pai believed that buprenorphine maintenance treatment was the best option for him. Unfortunately, his housing status in the last year had undermined his ability to enter a program. In his mid-thirties, Dani slept on a dirty mattress on the floor of a back room in a dilapidated two-story house that served as a shooting gallery. Lacking formal employment, he begged at the local church entrance and also in front of a dollar store. Dani started injecting young, while working to prepare drugs at a *punto*; he learned how to shoot up speedballs from watching other users and immediately liked it. Many years later he still enjoyed the effects, calling the high "the best in the world," but resented the pain of heroin withdrawal and having to hustle to get his "cure." "*Estoy tan aborrecido*" (I am fed up with the whole thing), he told me when discussing his plans, months before Maria hit the island. To quit, Dani planned to scale back his use to a more manageable level, one or twice a day, and then enter El Panamericano, a clinic that treated mental health disorders for one week, the maximum time allowed by public insurance (La Reforma/Medicare). He planned afterward to enroll in a buprenorphine maintenance program, a modality that had worked well for him in the past. Yet he worried that if he went into a treatment facility, he would have to leave his partner alone in the streets. She was also using drugs, but La Reforma, the local public insurance scheme, did not cover her treatment, due to the income assistance she received through Social Security.

Dani had enrolled in BMT a few times, with his longest stint lasting a year. During treatment, he calmed his anxiety by smoking marihuana and watching TV at home. To him, the benefits were evident: "fast weight gain, more energy, I ate better, slept better, I wasn't roaming out there at dawn." Although he had never tried it, Dani was disdainful of MMT: "It eats the calcium in your bones, in your teeth, leaving you toothless, and besides, you have to travel every day to the treatment center to take it." Another downside of methadone treatment, according to Dani, was the physical dependence and lethargy that the drug caused; since methadone left users "down," without energy, they used cocaine or crack to feel "up" again.

The last time Dani was in BMT he was forced to leave the program due to a lack of reliable transportation. To avoid this problem again, he planned to enter treatment right in town. In

the meantime, he bought diverted pills on the street, which cost as much as a bag of heroin, not a good deal, in his opinion. Better to have a prescription through a program, he stated, which was "the best thing that they have done to aid a user to quit his vice." Yet when we met Dani again nearly a year later, he was still injecting regularly, and suffering bad ulcers on his feet. He said he was "*aborrecido*" and wanted to quit, but it was hard. He had finally gone to the Panamericano clinic, but they turned him down: after so many years of injecting, the nurses had trouble finding a vein to do the required blood tests. This incensed Dani, giving him more reason to quit, as he had become "fed up with having to find a vein and missing," and complaining that treatment staff had "crucified" him, missing his veins repeatedly. In the meantime, Dani had developed other pressing physical concerns, such as the ulcers on his feet, and he worried that they might require amputation if left untreated.

3.5 Josephine

Josephine, a skinny 31-year-old woman, had been on methadone for more than 10 years. She started injecting as a teenager, she said, because she was "curious" and did not think about its "consequences." She engaged in sex work to afford the habit, and a client beat her and almost "killed" her, but, she said, "[I] never stole because it's not my thing." When she was still a teenager, she moved to New York City where she entered a methadone treatment program and stayed off drugs for a year and a half. She felt great, she said, but returned to injecting drugs soon after returning to Puerto Rico. It was then that she entered the methadone program where she was at the time of our interview.

Despite being enrolled in MMT, she did "*desarreglos*," "mess up" from time to time, mainly with her husband Mitchel. In addition to using speedballs, she also liked to smoke crack, perhaps because her high dose of methadone, 90 mg per day, left her sleepy and tired. Josephine believed that the program had a financial interest in penalizing people for their drug use—"*nos quieren dejar aqui porque hacen chavos*" (they keep us in there because they profit from us)—instead of helping patients manage their opioid addiction. She further resented the ways that the program controlled her life, from conducting surprise urine tests, to placing "stops" on the distribution of methadone after a "dirty" urine, to requiring a meeting with "*la social*" who would decide if she would be able to continue with the program.

Despite her complaints, Josephine liked MMT and believed that if followed correctly it would help her to manage her substance use. She said she would like to have kids, and believed she needed to stay away from drugs to form a family. Because of her drug use, she was required to go to the methadone treatment center daily to receive her "*botella*" (bottle, or dose). If she consistently tested negative for illegal substances, Josephine would have been able to receive a seven-day treatment supply, and later perhaps, a monthly one. She knew it would be a struggle but had not lost hope. After all, she had done it before.

3.6 José

José, now in his late thirties, had been injecting since adolescence but had quit a few years ago and since become very involved in Renacer (Reborn), a project to provide housing and treatment options for PWID. Renacer was being organized with the support of parishioners

from a local Catholic church, and its buildings were donated by the local town hall, after the public school on the premises was decommissioned. José helped in the construction of the site, keeping himself busy and away from drugs. However, recently "*se cayó*"—he went back to using. A bit ashamed, he explained that getting off drugs was hard. But José was not relying on MOUD. He had never tried either buprenorphine or methadone, because in his view, MOUD was only "changing one drug for another." Even though the substitute drug would be legal—and free for those covered by Medicare/Medicaid—he was convinced that it would also be very hard to quit. He claimed that buprenorphine and methadone withdrawal symptoms are even worse than those from heroin withdrawal, and decried the lack of energy, weak bones, and damaged teeth resulting from the switch to methadone. While José admires and is very grateful to Dr. Lusito, a charismatic physician who runs Renacer and directs a local Suboxone clinic, he has never contemplated entering Suboxone treatment.

José had quit drugs for extended periods of time but managed to do it through "detox," where no MOUD is provided. Instead, patients may be given psychiatric medication to relieve the anxiety produced by drug cravings or to help with sleep. Or patients may be expected to quit "cold turkey," without the help of any medications. José has also been a regular of Crea, a faith-based organization that provides detox services on the island. He appreciated its strict discipline and rules, and even justified the beatings and ice-cold showers administered to those who had committed "*faltas*," that is, infractions that needed to be punished. In Crea, José thrived and moved up in the hierarchy from a novice to an experienced member whom others had to obey. Still, over the years, he oscillated between periods of use and periods of abstinence. If José manages the "strength," he said, he would go back to a detox program, probably at Crea, where he hoped he could quit injecting for good.

4. Discussion

Findings from this study show that the barriers to MOUD access and retention among rural PWID can be significant and compound. As the treatment trajectories of Bebe, Danny mi Pai, Josephine, and José illustrate, poverty, homelessness, injection frequency, speedball use, lack of transportation, a paucity of MOUD options in rural Puerto Rico, and previous negative experiences with MOUD might constitute powerful barriers to treatment. In addition, Hurricane Maria devastated the health infrastructure of the island, shutting down methadone and buprenorphine treatment centers for weeks or even months, which reinforced and created additional barriers.

Poverty is a significant barrier to MOUD. Poor PWID often have trouble securing proper identification cards and health insurance cards, which are required for MOUD enrollment. This disadvantage is particularly severe among homeless PWID in rural Puerto Rico. This population is extremely mobile, moving from town to town in search of better money-making opportunities or when illegal venues have poor-quality drugs or have been disrupted by the police. Such instability combined with precarious living arrangements might lead to the loss of important documents required for enrollment, such as identity cards or health insurance cards. In addition, poverty is related to another health disparity—poor transportation makes it extremely hard for this population to regularly access treatment

centers that, in rural areas, may be located many miles away. As Bebe's narrative shows, even middle-class participants might see their plans fail due to minor disruptions such as unreliable or inadequate transportation.

In turn, poverty and other structural determinants shape participants' views and previous experiences with MOUD. Josephine's story illustrates the ambivalence that PWID may feel toward rules that seem to disproportionally penalize the poor (Igonya et al. 2020). In our study, PWID oscillated between "accommodating" the bureaucracy of MOUD programs and "resisting" the rules that govern them. Participants deemed "not cooperative" might be pushed out of MOUD, which would likely affect any future decisions to enroll. Indeed, negative past experiences with MOUD might explain our participants' extremely low rate of seeking substance use treatment in the year prior to interview. Participants' attitudes are also shaped by their beliefs about MOUD efficacy, as José's narrative shows. A study of heroin users in the U.S.-Mexican border region similarly shows that participants often reject treatment in a context of poverty and dispossession because they resist the notion of chronicity associated with entering and remaining in these programs, which sometimes can go on for years or even longer (Garcia, 2010). In addition to a desire for greater treatment autonomy (McLean & Kavanaugh, 2019), PWID might internalize the social stigma that often accompanies MOUD, resorting to diverted methadone or buprenorphine as a way of managing addiction without becoming institutionalized (Allen & Harcopos, 2016).

The individual treatment trajectories in this study, some spanning decades of attempts to enter and remain in MOUD, demonstrate that while barriers are lived and experienced individually by each participant, they are shaped by larger structural forces. PWID in rural Puerto Rico seeking MOUD also face the effects of a large-scale economic crisis, crumbling public infrastructure, expanding opioid markets, and a persistent cultural stigma around so-called substitution treatment (Bonilla & LeBron 2019; Echautegui, Segarra, & Cordero, 2016; Gelpi-Acosta, Rodriguez-Diaz, Aponte-Melendez, & Abadie, 2020; Mulligan, 2014; Rodriguez-Diaz et al., 2017).

Departing from epidemiological studies that tend to treat MOUD barriers independently of one another or of the social context in which participants make decisions about enrolling in therapy, this study replicates findings that illustrate the compounded effects of individual and structural factors in MOUD enrollment (Ambeak et.al., 2013; Bourgois & Schonberg, 2009; Carroll, Rich, & Green, 2018; Harris & Rhodes, 2013; Grub et al., 2019; Guarino, Mateu-Gelabert, Teubi & Goodbody, 2018; Sarang, Rhodes, & Sheon, 2013; Singer, Bulled, Ostrach, & Mendenhall, 2017; Rhodes, 2009; Treloar & Valentine, 2013).

Participants entered MOUD at different times in their careers, for different reasons, and with different outcomes. This suggests that MOUD treatment alone is not sufficient to address the addiction/relapse cycles associated with opioid dependence (Leshner, 1997). Because users may attempt to quit opiates many times before succeeding (Timko et al., 2016), greater support among treatment providers appears necessary to make MOUD treatment sustainable. Our findings indicate the need for interventions to reduce the barriers that poor and other vulnerable PWID face in accessing MOUD services. Research has proposed a number of solutions, from administering MOUD in homeless shelters (Chatterjee et al., 2017) to

establishing outreach programs that employ a mobile unit to bring services to this population (Hall et al., 2014). Others have suggested integrating primary care with MOUD services (Kresina & Lubran 2011). And while chronic underfunding of MOUD cannot be easily solved, some have suggested that treatment facilities could assist prospective patients in securing the documentation required to access treatment (Tran et al., 2017).

Policy recommendations should pay more attention to the combined effects of these barriers, instead of treating them in isolation. Furthermore, treatment providers must look beyond current MOUD models, which are oriented toward controlling and disciplining patients, toward a flexible MOUD delivery that can adapt to participants' varied experiences and needs (Huhn, Tompkins, & Dunn, 2017; Krauwcyk et al., 2019).

In September 2017, Hurricane Maria devastated Puerto Rico's infrastructure. Many of the island's 3.5 million residents spent months without electricity, reliable health services, and even food and potable water, and many are still struggling to access these basic necessities as of this writing. Such issues are likely to have their largest impact on the island's most marginal populations, including rural PWID. Reports from local clinics and syringe-exchange sites indicate that the availability of medically assisted MOUD continues to be severely disrupted, particularly in rural areas. Some barriers, such as a lack of insurance, homelessness, or a high frequency of injection drug use, were present before Maria struck. But given findings after disasters in other regions, these factors have likely combined with the devastating effects of this natural disaster to reinforce pre-existing barriers to MOUD access. Studies conducted in the aftermath of hurricanes in New York City and New Orleans documented an increase in HIV risk behaviors and drug use–related harms, such as drug overdose (Cepeda, Valdez, Kaplan, & Hill, 2010; Pouget, Sandoval, Nikolopoulos, & Friedman, 2015). Hurricane Maria may have generated new dynamics on the ground, complicating transportation and availability, and thereby creating entirely new barriers to access. Treatment providers urgently need to understand the effects of natural disasters on MOUD access in rural areas, especially given the effects of climate change on the frequency of extreme weather events. This study documents barriers to MOUD in the aftermath of Hurricane Maria.

5. Limitations

The study has some limitations. Based on a population of PWID in rural Puerto Rico, a U.S. territory, findings about barriers to MOUD might not be transferable to other settings, for example, urban locations. Despite this limitation, this study is the first to document the barriers and facilitators of MOUD in a population of rural PWID that had not been studied before, and its emphasis on the social forces that support or impede MOUD recruitment and retention represent a contribution to the field. Given the opioid epidemic in the rural United States, this study's findings can be used to shape policies that increase recruitment and retention of PWID in rural areas.

6. Conclusion

PWID in rural Puerto Rico show a low level of MOUD enrollment. This study found that individual, institutional, and structural barriers (such poverty, punitive clinic rules, and poor public transportation) compound, limiting participation in MOUD. In turn, stigma, discrimination, and bureaucratic norms shape MOUD participants' experiences, contributing to poor retention outcomes. Policies that increase the availability of MOUD services in the region, coupled with innovative delivery services involving mobile or targeted interventions for homeless populations, may facilitate access to MOUD. Policymaking should also consider how barriers can combine and reinforce one another, instead of looking at them in isolation and outside the social context in which prospective MOUD participants make decisions about enrollment.

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Highlights

- While barriers to access and retention to Medication for Opioid Use Disorder among people who inject drugs are well established, little is known about how barriers interact with one another to shape treatment trajectories.
- Poverty, lack of identification or health insurance cards, homelessness, and transportation and treatment availability, along with previous negative treatment experiences, compound to erect barriers in rural Puerto Rico.
- Policy should consider barriers not in isolation but as an assemblage of many factors.

Table 1:

Demographic and substance use information for PWID in rural Puerto Rico, 2019.

	Full Sample (N = 177)		Qualitative Subsample (N = 31)	
Variable	**Mean/%**	**Std. Dev.**	**Mean/%**	**Std. Dev.**
Age (years)	46.2	10.4	46.7	9.3
Men	93.0		84.0	
Homeless in the Past 12 Months	31.0		42.0	
Unemployed Currently	78.0		90.0	
High School Completed	66.0		61.0	
Monthly Income ($)	531.9	626.6	814.8	794.5
Daily Drug Spending (average $)	41.9	27.4	54.1	32.4
In Treatment Currently	47.0		39.0	
Years Since First Injection	23.6	12.1	25.3	10.5
Inject 4 or more times per day	33.0		55.0	
Inject 1–3 times per day	36.0		26.0	
HIV Positive	6.0		3.0	
HCV Positive	67.0		94.0	

*Data exhibited in this table are based on a convenience sample extracted from a larger population of PWID enrolled and nonenrolled in MOUD in rural Puerto Rico.