Mapping Buprenorphine Access at Philadelphia Pharmacies

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Objectives: Buprenorphine is not reliably stocked in many pharmacies, and pharmacy-level barriers may deter patients from opioid use disorder care. We surveyed all outpatient pharmacies in Philadelphia to describe variation in buprenorphine access and developed a map application to aid in identifying pharmacies that stock the medication.

Methods: Using a dataset from the Bureau of Professional and Occupational Affairs, we conducted a telephone survey of operating outpatient pharmacies (N = 422) about their buprenorphine stocking and dispensing practices. We used ArcGIS Pro 3.0.3 to join US Census Bureau ZIP code-level race and ethnicity data, conduct descriptive analyses, and create a map application.

Results: We collected data from 351 pharmacies (83% response rate). Two hundred thirty-eight pharmacies (68%) indicated that they regularly stock buprenorphine; 6 (2%) would order it when a prescription is sent. Ninety-one (26%) said that they do not stock or order buprenorphine, and 16 (5%) were unsure. We identified 137 "easier access" pharmacies (39%), meaning they regularly stock buprenorphine, dispense to new patients, and have no dosage maximums. Zip codes with predominantly White residents had a median (interquartile range) of 3 (2–4) "easier access" pharmacies, and those with predominantly Black residents a median (interquartile range) of 2 (1–4.5). Nine zip codes had no "easier access" pharmacies, and 3 had only one; these 3 zip codes are areas with predominantly Black residents.

Conclusions: Buprenorphine access is not equitable across Philadelphia and a quarter of pharmacies choose not to carry the medication. Our map application may be used to identify pharmacies in Philadelphia that stock buprenorphine.

Key Words: buprenorphine, opioid use disorder, pharmacies, treatment barriers, overdose

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The United States (US) is facing a public health crisis of substance use disorders (SUDs) and overdose.[1] Although rising before the COVID-19 pandemic, overdoses spiked sharply during 2020, especially among adolescents and young adults and in communities of color.[2] Despite the existence of evidence-based medications for OUD (MOUD) such as buprenorphine and methadone, most individuals with OUD do not receive these treatments. There are also substantial racial, ethnic, socioeconomic, and geographic disparities in receipt of care.[3] These disparities are due to a confluence of factors including a lack of OUD treatment providers, geographic and transportation barriers to accessing care, medical racism, and stigma.[4,5]

Recent evidence has highlighted significant barriers to buprenorphine access at the pharmacy level. In areas of the US with the highest overdose rates, 1 in 5 pharmacies do not stock buprenorphine, and 30% endorse some level of barrier, including no current stock of the medication.[6] Access in some areas of the country is particularly scarce; a study of Texas pharmacies found that only 34% of pharmacies surveyed were prepared to dispense a 1-week supply of buprenorphine and a dose of naloxone.[7] Of the pharmacies that did not have any buprenorphine in stock, only 62% expressed willingness to order it if a prescription were sent.[7] A 2021 "secret shopper" study of a random sample of Philadelphia pharmacies found that only 25% had a 1-week supply of buprenorphine in stock, and of those who did not have buprenorphine available, only 36% were willing to order it.[8] Qualitative and survey research has highlighted the barriers patients face accessing buprenorphine, even at pharmacies that do stock it—including pharmacist refusal to fill prescriptions for new patients, patients who received care via telehealth, patients prescribed high dosages, patients who live far from the pharmacy, and prescriptions from nonlocal prescribers.[9-13] A survey of patients at an OUD treatment program in one rural health system found that nearly 35% reported difficulties receiving buprenorphine at pharmacies, and pharmacy-level barriers to access was associated with an increased odds of acquiring nonprescribed buprenorphine from the street.[14]

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We received University of Pennsylvania Institutional Review Board approval before any study activities.

SA, RF and ML conceived the study. SA supervised the study. AS collected the data. SA and ES completed the analyses. SA led the writing. RF, AS, ES, NO, JP, and ML assisted with the study and writing.

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Pharmacy-level barriers likely have several causes.[9] In light of penalties faced by some pharmacists in response to the overdispensing of opioid agonist medications, many pharmacists may fear that dispensing any controlled substance—including buprenorphine—puts them at legal risk, even without evidence that this is the case.[11,13] Pharmacists may also believe that patients are prone to misusing or diverting buprenorphine.[9,15] Stigma surrounding OUD medications extends to naloxone; in 2016, 71% of 157 West Virginia pharmacists surveyed believed that dispensing naloxone without a prescription could lead to increased overdoses, presumably due to a belief that patients might use more opioids if they have naloxone on hand.[10] However, many pharmacists see buprenorphine as an important tool to address the worsening overdoses crisis and express positive attitudes about stocking and dispensing it.[16] Unfortunately, due to company-wide policies limiting buprenorphine dispensing at some large chain pharmacies and lack of insurance reimbursement for early buprenorphine refills, pharmacists may be restrained in their ability to help patients access the medication.[16]

Philadelphia has the highest overdose death rate of any large US city.[17,18] Efforts to expand access to OUD treatment include innovative programs like the University of Pennsylvania CareConnect Warmline, which provides same-day buprenorphine access to patients in need via telehealth visits.[19] CareConnect is integrated into Penn Medicine OnDemand, a telehealth urgent care program, and is staffed by clinicians trained to prescribe buprenorphine bridge prescriptions and substance use navigators who provide case management and assist patients in finding longitudinal care. This unique program ensures timely access to buprenorphine for patients with OUD, including patients who are already enrolled in an OUD treatment program but need a bridge prescription because they missed an appointment and are unable to get in contact with their usual prescriber.

Since the CareConnect Warmline began serving patients in November 2021, clinicians and substance use navigators reported pharmacy-level barriers to buprenorphine experienced by patients—including pharmacies across Philadelphia that did not carry buprenorphine, refused to dispense it to new patients, or required phone verification from the prescribing clinician before dispensing (in addition to the electronic prescription). The objective of this study was to describe variation in buprenorphine access in pharmacies across Philadelphia by surveying all pharmacies about their buprenorphine stocking and dispensing practices. In addition, we aimed to aid clinicians and patients at CareConnect and in other Philadelphia programs in finding pharmacies by creating a map application that identifies Philadelphia pharmacies that stock and dispense buprenorphine.

METHODS

Data Collection

We acquired a dataset from the Pennsylvania Bureau of Professional and Occupational Affairs containing the names, addresses, and phone numbers of all pharmacies in the City of Philadelphia (n = 502) in April 2022. We eliminated inpatient and hospital associated pharmacies (n = 45) for a final sample of 457 retail pharmacies. With approval from the University of Pennsylvania Institutional Review Board, a research assistant (RA) called the 457 pharmacies and asked to speak with a pharmacist and, if a pharmacist was not available, a pharmacy technician. She used a standardized script to identify herself as a member of a research team from the University of Pennsylvania. The script began with inquiring whether the pharmacy stocked buprenorphine. For pharmacies stocking buprenorphine, the RA would then query whether the pharmacy would dispense to both established patients and new patients; if the pharmacy had dosage limits above which they would not dispense; and other requirements such a buprenorphine tapering plan and/or phone verification from the prescriber. Pharmacy hours were also confirmed. If the RA was unable to reach anyone at the pharmacy or the person asked to be called back, the RA called again at a later date up to 3 times. Data collection took place between February 7, 2023, and March 23, 2023.

Data Analysis

We used descriptive analyses and geographical information system (GIS) mapping to describe and visualize pharmacy buprenorphine access across the city. Pharmacy addresses were geocoded using the ggmap package in R.[20,21] Once geocoded, the data file was imported into ArcGIS Pro 3.0.3 and pharmacies were mapped according to their corresponding latitude and longitude coordinates using the WGS 1984 coordinate system.[22] Descriptive analyses were performed with ArcGIS Pro 3.0.3. Data about overdose deaths were acquired from a publicly available report from the Philadelphia Department of Public Health, and zip code-level race data were acquired from the Census Bureau.[23,24] The US Census Bureau collects extensive data on race and racial subgroups, then grouping into 6 major categories at the ZIP code (used in this analysis), and other geographic levels. These groups include African-American/Black, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, White, and some other race. The Census Bureau also collects data about Hispanic/Latino ethnicity.

RESULTS

Of the 457 outpatient pharmacies, 35 were permanently closed or out of service. Seventy-one pharmacies were marked unreachable after 3 attempts, leaving 351 pharmacies in the final dataset (response rate among operating pharmacies, 83.2%). The RA spoke with a pharmacist at 272 pharmacies(78%), a pharmacy tech at 68 pharmacies (19%), and for 11 (3%) of the calls, the RA was unable to verify the role of the staff member she was speaking with. Two hundred thirty-eight pharmacies (68%) indicated that they regularly stock buprenorphine; 6 (2%) indicated they would order it on an as-needed basis if a prescription is sent. Ninety-one pharmacies (26%) said they do not stock or order buprenorphine, and 16 (5%) were unsure or would not disclose. One hundred fifty-six of the pharmacies (64%) that dispensed buprenorphine reported that they did not have a set dosage maximum above which they would not dispense. Sixty-four (26%) did not know if there was a dosage maximum policy or would not share that information. Twenty-four pharmacies said that they had a dosage maximum policy above which they would not dispense, with the vast majority citing 3 films a day or 24 mg as the maximum, although 4 pharmacies cited lower doses (8 or 16 mg)

as the maximum. At 3 of the pharmacies with dosage maximums, the staff member did not know the maximum dose.

Of the 244 pharmacies that stocked or would order buprenorphine, 154 (63%) expressed that they would dispense the medication to new patients without restrictions. The remaining 90 (37%) stated that they would only dispense to established patients of the pharmacy or would need to speak with the prescriber before dispensing buprenorphine to a new patient. See Figure 1 for visual depiction of the data collection process and results.

We identified 137 pharmacies (39% of all pharmacies) that regularly stock buprenorphine, do not have known dosage maximums, and dispense to established and new patients without requiring a verbal verification from the prescriber; we labeled these pharmacies "easier access." When exploring pharmacy access by zip code, zip codes with predominantly (≥50%) White residents had a median (interquartile range) of 3 (2–4) "easier access" pharmacies, and zip codes with predominantly (≥50%) Black residents a median (interquartile range) of 2 (1–4.5) "easier access" pharmacies. Nine zip codes had no "easier access" pharmacies and 3 zip codes had one. All 3 of these zip codes are areas with predominantly Black residents. Among these zip codes, one (19143) experienced an increase in fatal overdoses between 2020 and 2021, and nearly a doubling in fatal overdoses from 2017 (22 overdose deaths) to 2021 (42 overdose deaths). Besides the one "easier access" pharmacy, four other pharmacies in the 19143 zip code stated that they did not stock buprenorphine. The 2 remaining pharmacies in that zip code were unreachable.

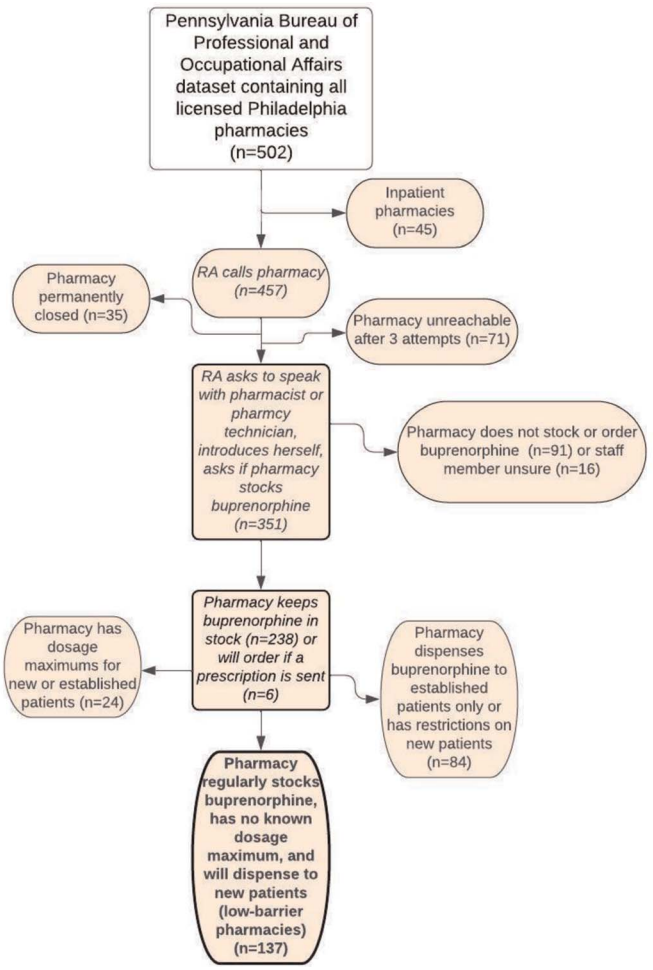

FIGURE 1. Pharmacy data collection flow diagram.

The 19134 zip code (Kensington) often receives attention for having the highest fatal overdose rate in the city, in addition to high rates of homelessness and public drug use. Fatal overdoses in this zip code fell between 2021 and 2017, from 209 to 169. This area has 16 pharmacies that carry buprenorphine (19 pharmacies total) and 11 "easier access" pharmacies.

To support patients and clinicians in finding pharmacies in Philadelphia that stock and dispense buprenorphine, we created a publicly available map application, available at this link: https://upenn.maps.arcgis.com/apps/instant/interactivelegend/index.html?appid=8330faf7a07f406fb6a19812af85aad9.

DISCUSSION

As the opioid overdose crisis intensifies, patients desiring OUD treatment must have access to evidence-based medications. Because even a short delay in care can lead individuals experiencing withdrawal and cravings to use substances from the street and risk overdose, best practice indicates that clinicians should attempt to minimize barriers to timely medication access.[25] A frequently overlooked barrier to timely buprenorphine access is at the pharmacy level, where a denial of medication may result in delays and leave patients feeling frustrated, stigmatized, or potentially too discouraged to continue with care.[13] In this study, we surveyed pharmacies across Philadelphia and found that a quarter did not stock the medication. In addition, only 39% of pharmacies were "easier access," suggesting that the majority of pharmacies that endorse stocking the medication might still present significant barriers to access. Many pharmacies reported either having a dosage maximum or not knowing if there was one in place. This is especially problematic given that doses of 24 mg or higher are likely needed for some patients using fentanyl.[26-29]

Our findings mirror those of previous studies that have found a significant percentage of pharmacies do not carry buprenorphine, even in areas of the country with high opioid overdose rates.[6,7] Unlike some of these other studies, we did not use "secret shopper" methodology, and our findings may not fully account for the access barriers patients might face. Qualitative research suggests that even among pharmacies that stock and dispense buprenorphine, pharmacy staff may make subjective decisions about dispensing the medication to certain patients based on characteristics like how far a patient lives from the pharmacy, if the patient has used the pharmacy in the past, if the patient is insured, or the patient's appearance.[11,13,30] Previous studies assessing pharmacist attitudes about buprenorphine suggest that pharmacist trust of patients and prescribers can play an important role in their comfort dispensing the medication.[9,13]

An additional important finding of our study is the uneven distribution of "easier access" pharmacies across the city —ie, pharmacies that keep buprenorphine in stock and are willing to dispense to new patients. The West Philadelphia zip code 19143 experienced nearly a doubling in overdose deaths between the years 2017 and 2021, and 76% of the residents in this

area identify as Black or African American.[24,31] This area only had 1 "easier access" pharmacy; none of the other pharmacies in this zip code reported stocking buprenorphine. The other 2 zip codes with one "easier access" pharmacy, 19138 and 19150, are also both predominantly Black communities, with 93% of their residents identifying as Black (data about changes in overdose rates in these zip codes is currently unavailable). A large body of literature highlights how Black patients with OUD are less likely to receive evidence-based treatment with medication. Among those who do receive medication, Black patients are more likely than White patients to be offered methadone only, rather than a choice of methadone or buprenorphine.[5,32,33] While programs like CareConnect can help address racial disparities in care access by eliminating the geographic barriers that limit prescriber access for some Black patients, inability to pick up medication at a pharmacy in one's neighborhood is a serious barrier that needs addressing.

The area of Philadelphia that has arguably receives the most attention pertaining to substance use and overdose is Kensington (19134). This neighborhood has been the subject of many national news stories about fentanyl, homelessness, and public substance use.[31,34] Thirty percent of Kensington residents are White, 14% are Black, and 51% are of Latino/Hispanic ethnicity.[24] However, because of high rates of unsheltered homelessness in this area, Census data may not accurately reflect the full community of people living and receiving SUD services there.[31] Although it remains the zip code with the highest number of fatal overdoses, the number has decreased since 2017, likely in part due to many important efforts by harm reduction groups and substance use treatment providers in the area.[35] It also has a relatively large number of pharmacies that carry buprenorphine (16) and "easier access" pharmacies (11). Although high rates of overdose death persist in Kensington despite a concentration of harm reduction activities and pharmacies that carry buprenorphine, overdose rates have been slowly falling. It is possible that increased media attention on opioid use and overdose in the area has influenced pharmacies to stock buprenorphine.

Philadelphians in other parts of the city have argued that the focus on Kensington has left their neighborhoods out of overdose response efforts.[36] In 2021, the zip code with the second highest overdose death rate was 19140, a neighborhood in North Philadelphia. This area had 84 deaths in 2021, up from 48 in 2017. Fifty-one percent of residents in this zip code identify as Black and 3% identify as White; 42% are of Hispanic/Latino ethnicity. This neighborhood has only 2 pharmacies that stock buprenorphine and one that can order it. As reported by Aubrey Whelan for the Philadelphia Inquirer, an informant told her: "The awareness is not there at all. I see it in Kensington—they have outreach there for poverty and drug use, and safe, effective harm reduction," he said. "But in North Philly, it's not where it should be at all."[36]

As of 2020, Philadelphia pharmacies are mandated to carry naloxone.[37] A similar policy focused on buprenorphine might help ensure an equitable spread of the medication across neighborhoods, however, municipalities would need to address important questions including the types of buprenorphine formulations and dosages to be mandated and how to reimburse pharmacies if prescriptions are never sent or picked up. As suggested by other researchers in this field, addressing pharmacists' concerns about buprenorphine dispensing, namely, fears of scrutiny by the Drug Enforcement Administration, is likely an important step in encouraging more pharmacies to carry and dispense the medication.[9,38] In addition, increasing pharmacist and prescriber communication and cooperation could improve pharmacists' trust in prescribers, which has been cited as an important factor in buprenorphine dispensing decisions.[9,11,13] Previous studies have found that pharmacists feel more comfortable dispensing buprenorphine after receiving communication with prescribers either by phone or via prescription notes.[9] Increased opportunities for interdisciplinary education, either during clinical training or continuing education courses, may also help foster trust across disciplines. Finally, as previous studies have highlighted misunderstandings among some pharmacists about the use of buprenorphine to treat OUD, both pharmacy students and practicing pharmacists would likely benefit from improved educational opportunities about MOUD.[39] As teleprescribing of buprenorphine becomes more common and the DEA formulates its final rule regulating the use of telehealth for OUD treatment (as of this writing, COVID-era telehealth flexibilities have been extended until December 31, 2024[40]), addressing pharmacy barriers to buprenorphine access, especially those rooted in pharmacist distrust of prescriptions from nonlocal prescribers, is crucial.

This research has several important limitations. We were unable to reach and collect data from 71 pharmacies. However, we calculated Global Moran's I, a measure of spatial autocorrelation, to assess whether unreachable pharmacies were grouped in certain zip codes. The Moran's Index was 0.293872 ($P < 0.0001$), which points to the distribution by zip being mostly random. Of the pharmacies we did reach, in some cases pharmacy staff did not know an answer to some of our questions or stated that they were unable to answer. We chose to collect data from pharmacy staff if pharmacists were not available to maximize the number of pharmacies from which we were able to collect data; however, we acknowledge that pharmacy staff may have been less prepared to answer these questions than would pharmacists. We did not ask about the formulations or brands of buprenorphine that pharmacies carry. In comparing the number of "easier access" pharmacies across zip codes, we did not consider the total number of pharmacies, meaning that it is possible that zip codes with fewer "easier access" pharmacies had fewer pharmacies overall. As previously mentioned, because we did not use secret shopper methodology, it is possible that pharmacies that reported stocking and dispensing buprenorphine might refuse patients for a variety of reasons; a follow-up secret shopper study might help us more deeply understand the barriers that patients face. A follow-up study could also help elucidate reasons that pharmacies do not stock buprenorphine which could help generate solutions.

CONCLUSIONS

Opioid overdose death rates continue to rise across the US. Efforts to expand access to evidence-based treatment with medications include initiatives to encourage more clinicians to prescribe buprenorphine. However, an important barrier to buprenorphine access lies at the pharmacy level, where pharmacies may choose not to stock and dispense the medication. Our survey of Philadelphia pharmacies found that buprenorphine

access is not equitable across the city and a quarter of pharmacies surveyed choose not to carry the medication. Municipalities may consider policy changes to ensure access to this vital medication, mirroring Philadelphia's mandate that pharmacies in the city carry naloxone. In the meantime, our pharmacy mapping application can support clinicians and patients in finding Philadelphia pharmacies that stock buprenorphine.

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