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BRIEF REPORT

General Medicine

# Age and racial and ethnic disparities in filled buprenorphine prescriptions post-emergency department visit in Nevada

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## Abstract

**Objectives:** We described age, gender, race, and ethnicity associations with filling buprenorphine prescriptions post-emergency department (post-ED) visits.

**Methods:** We analyzed 1.5 years (July 1, 2020–December 31, 2021) of encounter-level Medicaid ED and retail pharmacy claims data obtained from the Nevada Department of Health and Human Services. We studied ED patients with an opioid use disorder (OUD) diagnosis who did not fill a prescription for OUD medications within 6 months before the ED encounter. Using logistic regression, we modeled the associations between the patient's demographic characteristics and the outcome, filling a buprenorphine prescription at a community pharmacy within 14 or 30 days of the ED encounter.

**Results:** Among 2781 ED visits, representing 2094 patients, the median age was 39 years, 54% were male, 18.5% were Black, 11.7% were Hispanic, and 62.3% were White. Only 4% of the ED visits were followed by a filled buprenorphine prescription. Increasing age (14-day window: adjusted odds ratio (aOR) = 0.965, 95% confidence interval [CI]: 0.948–0.983) and being a Black patient (14-day window: aOR: 0.114, 95% CI 0.036–0.361) were both associated with lower odds of filled buprenorphine prescriptions. These results were similar within 30 days of an ED visit.

**Conclusions:** Initiation of buprenorphine following an ED visit remains low among Nevadan Medicaid patients and is less likely with increasing age and among Black patients, despite strong evidence supporting its use. Overburdened EDs, lack of attention from managers, and substance use stigma are among possible explanations. When ED clinicians do write buprenorphine prescriptions, peer recovery support could increase the fill rates.

KEYWORDS
buprenorphine, emergency department, Medicaid, opioid use disorder

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# 1 | INTRODUCTION

## 1.1 | Background

In 2021, over 75,000 Americans died from opioid overdoses.[1] Recommendations in Europe and North America emphasize increasing access to treatment with buprenorphine, a medication for opioid use disorder (OUD), which demonstrated reduced illicit opioid use, opioid overdose risk, and deaths.[2–4] Policies, such as the Drug Addiction Treatment Act of 2000, the Substance Abuse and Mental Health Services Final Rule, and the Comprehensive Addiction and Recovery Act, license clinicians to prescribe buprenorphine in office-based settings.[5–7] However, based on the analysis of October 2013 to September 2016 claims data, only 21% of persons with OUD received buprenorphine treatment in an office-based setting in an assessment in six states.[8] Also, buprenorphine is known to be underused nationally.[9]

Buprenorphine can be prescribed in the emergency department (ED), although its use in this setting is nascent.[10] Initiation of buprenorphine in the ED may reduce barriers to buprenorphine treatment by facilitating access at the time of a visit, thus creating a "reachable moment." [11,12] D'Onofrio and colleagues found that this approach increased buprenorphine use in a randomized clinical trial.[13] Buprenorphine treatment can be offered in macrodoses the same day to patients who are not abstinent from illicit opioid use, unlike naltrexone.[11,14] Macrodosing entails administering a high dose of buprenorphine treatment.[15] While buprenorphine is increasingly used in the ED to treat persons with OUD,[16,17] there is insufficient information on the proportion of ED visits for OUD that result in buprenorphine prescriptions being filled at a retail pharmacy after the visit, and the sociodemographic differences associated with this outcome.

## 1.2 | Importance

Studies that have established age, gender, racial, and ethnic disparities in buprenorphine access are limited to office-based outpatient settings.[18] In research conducted among non-ED hospital outpatients, Black study participants had 77% lower odds of receiving buprenorphine at hospital visits compared to White participants, while males had 122% higher odds of receiving buprenorphine compared to females during hospital visits.[18] While middle-aged persons (30–50 years) with OUD had 68% higher odds of receiving buprenorphine, older persons (>50 years) had 62% lower odds in the same study.[18] These disparities have not been reported in ED settings and serve as the basis for our study. It is important to document age, gender, racial, and ethnic disparities in buprenorphine treatment gaps as a first step toward developing targeted interventions in the ED.

## 1.3 | Goal of this investigation

We contribute new evidence on whether these disparities persist in the delivery of buprenorphine in the ED. In this study, we sought to: (1) quantify the frequency of buprenorphine use following ED visits among people with OUD diagnosis and, (2) establish the association between sociodemographic characteristics and buprenorphine prescriptions filled post-ED visit.

**The Bottom Line**

There is insufficient information on the proportion of emergency department (ED) visits for opioid use disorder that result in buprenorphine prescriptions being filled at a retail pharmacy afterward. In an analysis of a Nevada Medicaid cohort, we found that 4% of patients with opioid use disorder initiated buprenorphine treatment following an ED visit, with this proportion being lower among older individuals and Black patients. When ED clinicians prescribe buprenorphine, peer recovery support is crucial for increasing buprenorphine fill rates, especially among Black patients who are at higher risk for overdose.

# 2 | METHODS

## 2.1 | Study design and setting

This was a retrospective review of encounter-level Nevada Medicaid ED and pharmacy claims data from July 1, 2020, to December 31, 2021. The study period was chosen to provide 18 months of statewide data. The data were obtained from the Office of Analytics, Nevada Department of Health and Human Services. The institutional review board of the University of Nevada, Reno #1861327-3 approved the study.

We studied ED visits for patients who had an OUD diagnosis but were naïve to medication for OUD (i.e., no evidence in the claims data of receiving any medication for OUD within 6 months of ED visit). ED visits were determined to be for OUD when the ED visit claim record had any of the ICD-10 diagnosis codes: F11–F11.99. Buprenorphine naïve was identified by the absence of buprenorphine prescriptions during the 6 months before the ED visit. The 6-month look-back period was designed to balance the sensitivity of capturing buprenorphine prescriptions truly filled for OUD naïve patients and the specificity of not capturing patients with prior buprenorphine prescriptions filled for OUD use. Given that the National Quality Forum quality measure #468 uses a threshold of 7 days to indicate a break in buprenorphine treatment continuity, we believe the 6-month threshold achieves this balance.[19,20]

# 3 | MEASURES

## 3.1 | Outcomes

The outcomes of interest were whether the patient filled buprenorphine at a retail pharmacy (1 = yes) or not (0 = no) within a

threshold number of days after an ED visit with an associated OUD diagnosis. Specifically, prescriptions filled within 14 days (representing the time expected to elapse before a prescription expires) and 30 days (based on a prior study which indicated patients continued buprenorphine use at 30-day post-ED visit[13]) were counted. To determine whether the buprenorphine prescription was filled within each time frame, we merged ED visit dates with pharmacy claim fill dates. Buprenorphine prescriptions were identified in pharmacy claims using national drug codes compiled by the Centers for Disease Control and Prevention's National Center for Injury Prevention and Control.[21]

### 3.2 | Predictors

We created age groups (15–24, 25–34, 35–44, 45–54, 55–64, 65+) and gender (1 = female, 0 = male) variables from ED claims. We defined four "race and ethnicity" categories: Asian and others, Black, Hispanic, and White. The patients were coded as Hispanic if the race and ethnicity variable in the Medicaid data identified them as Hispanic or a combination of Hispanic and any other race. Those identified in the data as non-Hispanic Black and non-Hispanic White were coded as Black and White, respectively. Due to the small numbers of "Asians and other categories of race and ethnicity" in the data, we created a combined category (see Supporting Information for detailed mapping of race and ethnicity categories).

### 3.3 | Analysis

Associations between independent variables (age, gender, race, and ethnicity) and the dependent variable (filled buprenorphine prescription) were estimated using a logistic regression. We presented odds ratios and the corresponding 95% confidence intervals. Data were analyzed using SAS version 9.4.

### 3.4 | Main results

We studied 2781 person-visits representing 2094 patients. Among them, the median age was 39 years (interquartile range [IQR]: 32–52; data not shown in the table), 54% were male, 62.3% were White, 18.5% were Black, and 11.7% were Hispanic (Table 1).

### 3.5 | Filled buprenorphine prescription at the pharmacy

There were 105 (3.8%) and 132 (4.8%) buprenorphine prescription-filled person-visits for the 14- and 30-day windows, respectively. The median number of days between the ED visit and the buprenorphine fill was 6 (IQR: 4–9) and 7 (IQR: 5–12) for the 14- and 30-day windows, respectively.

**TABLE 1** Demographic characteristics of persons with opioid use disorder (OUD) with emergency department (ED) visits, by 14-day buprenorphine prescription status (*N* = 2781).

| Characteristics | Overall (*N* = 2781) Frequency (%) | Filled buprenorphine[a] (*N* = 105) Frequency (%) | Did not fill buprenorphine (*N* = 2676) Frequency (%) |
|---|---|---|---|
| Age | | | |
| 15–24 | 133 (4.8) | 5 (4.8) | 128 (4.8) |
| 25–34 | 865 (31.1) | 40 (38.0) | 825 (30.8) |
| 35–44 | 786 (28.3) | 46 (43.8) | 740 (27.7) |
| 45–54 | 457 (16.4) | 7 (6.7) | 450 (16.8) |
| 55–64 | 391 (14.1) | 6 (5.7) | 385 (14.4) |
| 65+ | 149 (5.4) | 1 (1.0) | 148 (5.5) |
| Gender | | | |
| Male | 1501 (54.0) | 57 (54.3) | 1444 (54.0) |
| Female | 1280 (46.0) | 48 (45.7) | 1232 (46.0) |
| Race and ethnicity | | | |
| Asian and others | 209 (7.52) | 8 (7.6) | 201 (7.5) |
| Black | 514 (18.5) | 3 (2.9) | 511 (19.1) |
| Hispanic | 325 (11.7) | 10 (9.5) | 315 (11.8) |
| White | 1733 (62.3) | 84 (80) | 1649 (61.6) |

[a]Filled a buprenorphine prescription within 14 days of the ED visit.

### 3.6 | Factors associated with filling buprenorphine after an ED visit

For every year increase in age, there was an estimated 3.5% decrease in the odds of filling a buprenorphine prescription within 14 days (aOR: 0.965, 95% confidence interval [CI]: 0.948–0.983) (see Table 2). Compared to White, being a Black patient was also associated with 88.6% reduced odds of filling a buprenorphine prescription within 14 days (aOR: 0.114, 95% CI: 0.036–0.361). Gender was not associated with the outcome. The results were similar for the outcome using the 30-day window (Table 2).

## 4 | LIMITATIONS

Our study has some potential for misclassification of the outcome construct (prescriptions written in the ED). We may have undercounted buprenorphine prescriptions written if not all prescriptions written in the ED were filled or if patients filled and paid for ED prescriptions using self-pay or other non-Medicaid insurance.[18] Another potential source of misclassification also relates to our outcome construct.[22] We may have overcounted buprenorphine prescriptions if prescriptions assumed to have been written in the ED (based on being filled within 14 or 30 days of the patient's ED visit) were actually written in any other setting. Despite these sources of potential misclassification,

**TABLE 2** Predictors of filling buprenorphine at the pharmacy among all persons with opioid use disorder (OUD) with emergency department (ED) visits ($N = 2781$).

| | 14-day window | | 30-day window | |
|---|---|---|---|---|
| **Characteristics** | **aOR (95% CI)** | ***p*-value** | **aOR (95% CI)** | ***p*-value** |
| Age[a] | 0.965 (0.948–0.983) | 0.0002 | 0.963 (0.947–0.979) | <0.0001 |
| Female | 1.051 (0.708–1.561) | 0.8046 | 1.072 (0.751–1.529) | 0.7031 |
| Race and ethnicity | | | | |
| Asian and others | 0.658 (0.311–1.390) | 0.2160 | 0.709 (0.371–1.353) | 0.0628 |
| Black | 0.114 (0.036–0.361) | 0.0026 | 0.088 (0.028–0.280) | 0.0006 |
| Hispanic | 0.514 (0.262–1.010) | 0.6171 | 0.479 (0.258–0.888) | 0.6137 |

[a]Age as a continuous variable.

prescriptions filled at a pharmacy have been identified as a reliable measure of prescribing behavior.[23,24]

Also, our findings could have been influenced by the COVID-19 pandemic, since hospitals were focused on the pandemic response and may not have been equipped to attend to substance use disorder treatment needs among persons with OUD.[25] Another important historical event that could have influenced our findings is that buprenorphine practice guidelines were updated to replace the X-waiver with a "notice of intent" in April 2021. Theoretically, this should have increased the availability of buprenorphine prescribing in ED settings. However, the effect of the COVID-19 pandemic might have persisted, reducing ED-initiated buprenorphine prescriptions and ultimately limiting the filling of the prescriptions at the pharmacy.[24]

A final limitation pertains to the scope of the present analysis. While we did not have access to patient characteristics such as income (beyond Medicaid eligibility criteria), occupation, or education, the present research could be extended to these and other demographic characteristics to give a more complete picture of ED buprenorphine prescribing. Another fruitful direction for future research would be to explore the hospital, ED, and clinician characteristics associated with successful buprenorphine initiation. The generalizability of the findings may not extend beyond Medicaid in Mountain West states with similar age, and race and ethnicity distributions.

## 5 | DISCUSSION

Our study analyzed Nevada Medicaid data from 2020 to 2021 and examined the prevalence of and demographic factors associated with filling a buprenorphine prescription within 14 and 30 days of an ED visit among people with an OUD diagnosis. Only about 4% of ED visits by persons with an OUD diagnosis were followed by a filled buprenorphine prescription, which means that the vast majority did not fill a prescription. Many of the ED visits for OUD-diagnosed patients may represent missed opportunities to initiate patients onto buprenorphine treatment through the ED. Implementing patient-oriented interventions such as positioning peer recovery support specialists (PRSSs) at the EDs can potentially increase buprenorphine prescription fill rates at the retail pharmacies. A PRSS is someone with lived experience of OUD but is currently in recovery, and it can provide information about available community resources for outpatient treatment continuity.[26,27]

Younger age and White race were associated with increased odds of filling a buprenorphine prescription. This novel finding is at variance with our hypothesis that older age individuals would be more likely to fill a buprenorphine prescription after presenting in the ED,[19] which was based on the other studies that observed a correlation between older age and buprenorphine use in the outpatient setting,[19] and studies which showed adolescents and young adults have fewer opportunities for treatment initiation.[28] One possible explanation for our finding is that older individuals with longer drug use careers may actually prefer methadone over buprenorphine because of its higher retention rate in treatment [29] or the perceived risk of buprenorphine precipitated acute withdrawal associated with concurrent fentanyl use.[30] However, current evidence indicates buprenorphine precipitated acute withdrawal is rare with fentanyl use (0.76%).[31] Reasons for reduced odds of filling a buprenorphine prescription following an ED visit among older persons with OUD are worth examining further.

We found that Black patients with OUD had lower odds of filling buprenorphine prescriptions after an ED visit compared to their White counterparts, which is consistent with previous studies in outpatient settings and pharmacy claims.[18,24] Historically, racial and ethnic minority groups, including those who are enrolled in Medicaid,[32] experience disparate access to medication for OUD.[18,33] This is supported both in a clinical trial [34] and in real-world settings.[35] In the context of the current opioid overdose crisis, ED-initiated buprenorphine treatment provides a unique opportunity to increase equitable access to OUD treatment and therefore prevent subsequent overdose deaths in persons with OUD irrespective of race and ethnicity.

Previous studies suggest an association between gender and filling buprenorphine prescriptions at the pharmacy.[18,36] The absence of an association with gender in our data differs from earlier studies and the reason for this is not clear.

The average 6-day delay in filling buprenorphine prescriptions among these Medicaid enrollees study cohort is noteworthy. This

implies the patients could have resumed illicit opioid use for nearly a week before commencing daily buprenorphine treatment. The potential reason for this patient's hesitancy in filling buprenorphine prescriptions is worth examining further in qualitative studies.

Our study found a low frequency of buprenorphine prescriptions filled by people with OUD in the 14- and 30-day following a visit to Nevada's EDs. We also found associations between the filling of buprenorphine prescriptions and demographic factors that could signal the potential for age and racial and ethnic-based disparities in treatment access. Overburdened EDs, lack of leadership support, and substance use stigma are among possible explanations.[25,37,38] These have programmatic implications. There is a need to focus attention on older adults and Black patients as the State of Nevada gradually routinizes the implementation of ED-initiated take-home buprenorphine for persons with OUD. When ED clinicians do write buprenorphine prescriptions, patient-oriented interventions such as peer recovery support could increase the fill rates.

## AUTHOR CONTRIBUTIONS

Olufemi Ajumobi conceived the study with contributions from Sarah Friedman and Karla D. Wagner and designed the data collection analysis plan with supervision from Sarah Friedman and Karla D. Wagner and contributions from John Westhoff, Michelle Granner, Julie Lucero, and Brandon Koch. Olufemi Ajumobi drafted the manuscript, and all authors contributed substantially to its revision. Olufemi Ajumobi takes responsibility for the paper as a whole.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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**Olufemi Ajumobi**, MD, MPH, PhD, is an ORISE Postdoctoral Fellow at the U.S. FDA. His mixed-method doctoral research explored the unmet need for buprenorphine treatment for opioid use disorder in Nevada emergency departments and associated sociodemographic differences, factors related to the intention to prescribe buprenorphine, and how the perspectives of emergency physicians influence decision-making related to prescribing buprenorphine.