



Opioid Use and Overdose Patterns in Puerto Rico in 2020-2022: A Retrospective Descriptive Study

Grisel Burgos-Barreto¹, German Garcia², Nikita Zanko³, José Gabriel Sánchez Santiago⁴

^{1,2,3,4} San Juan Bautista School of Medicine, Caguas, Puerto Rico, 00726

ABSTRACT: The opioid epidemic is a recent global phenomenon affecting the United States and its affiliated territories, including Puerto Rico. There is a considerable gap in knowledge on how this epidemic has affected Puerto Rico. This gap can hinder the capabilities of healthcare workers to deliver appropriate treatment and preventative strategies to vulnerable groups. This descriptive study aims to describe opioid use and overdose in Puerto Rico during 2020-2022. This study analyzed data gathered by the Puerto Rico mental health and addiction subdivision of the Public Health Department (Administración de Servicios de Salud y Contra la Adicción; ASSMCA). Some of the noteworthy trends in this study include that most participants who suffered an overdose were overwhelmingly male and in the age group of 35-44 years old. Furthermore, most cases occurred in large metropolitan areas and happened in open spaces during the 12 pm-5:59 pm period. These findings emphasize the need for targeted interventions that consider the sociodemographic characteristics and geographical variations in drug use and overdose incidents in Puerto Rico.

KEYWORDS: Demographics, Naloxone, Opioids, Puerto Rico Overdose.

INTRODUCTION

The opioid crisis in the United States and Puerto Rico has resulted in a significant increase in opioid-related deaths and addiction rates over the past few decades. Despite opioid prescriptions having declined by 40% since 2010 in the U.S, opioid-related overdose deaths continued to rise. This surge since 2013 is related to the spike in the availability and widespread distribution of synthetic opioids, mainly fentanyl, which is alarming since fentanyl is more potent and deadly than heroin [1]. In Puerto Rico, opioid drug addiction and overdose cases also represent significant social and health concerns. For instance, a 2017 analysis of U.S. data found that drug overdose mortality rates were significantly higher in the Puerto Rican demographic group compared to other Hispanic and non-Hispanic groups in the USA. In 2018, drug overdose mortality rate was highest among Puerto Rican men aged 45-54 years old, providing evidence of health disparity within this vulnerable group [2]. This concern is shared with other Latin American countries, such as Ecuador, that have seen an increase in opioid usage in its population within the last decade [3]. Moreover, the opiate crisis seems to be a relevant topic in Puerto Rico in the years following the COVID-19 pandemic, since Puerto Rican inhabitants were especially more vulnerable to developing an opioid use disorder due to factors such as poverty, homelessness, and distance to treatment [4].

Drug overdoses remain a common risk factor contributing to early mortality in the last century. Consequently, drug overdose-related mortality has risen to unprecedented extent, and prominence in the United States and Puerto Rico, throughout the opioid crisis in the last decades. While underlying socio-demographic conditions and unaddressed drug addiction remain persistent factors in the opioid-related health concerns [2]. Another public health concern is the accelerated fentanyl accessibility and distribution compared to other drugs, which could further increase overdose incidence and mortality [5]. Currently, it is estimated that more than 28,000 people use intravenous drugs in P.R. Still there are only five syringe services programs and six methadone clinics, which are poorly funded and are at service capacity to serve only 5,500 patients [6]. The mainstay treatment of acute opioid overdose in Puerto Rico is the administration of naloxone. Naloxone is a medication that reverses the effects of opioid overdose by blocking the opioid receptors in the brain and quickly restoring normal breathing. It is administered nasally or through injection and is essential in preventing fatalities. Furthermore, methadone is a substance prescribed to abstain from opioid drug consumption. According to a study on opioid distribution trends among United States territories from 2007 to 2014, Puerto Rico had the highest average morphine milligram equivalent (MME) per capita consumption in methadone [7]. The distribution primarily comes from narcotic treatment programs (NTPs), underlying the prevalence of opioid use on the island and emphasizing the need for further research into the demographics influencing factors.



Sociodemographic characteristics of drug use and overdose have been lacking due to limited data collection efforts. It is crucial to categorize the sociodemographic profiles of individuals experiencing opioid overdoses, understand the characteristics of opioid use, and analyze overdose patterns in Puerto Rico's most vulnerable regions. This effort is crucial to enhance our response to the opioid and health crises by identifying trends and establishing standardized thresholds within the context of health and social determinants. This study explored and described opioid drug use/overdose and associated sociodemographic factors. We addressed the literature gap by examining the sociodemographic characteristics associated with opioid drug use and overdose in a more detailed and comprehensive manner. Specifically, we describe the relationship between age, gender, urban/rural location, and public or private usage, and other factors with opioid usage and overdose in the data directly provided by the Puerto Rico mental health and addiction subdivision of the Public Health Department. Our study aimed to describe the sociodemographic characteristics and opioid usage/overdose patterns during 2020-2022 and the descriptive analysis to provide better insight into factors contributing to the opioid usage/overdose crisis in Puerto Rico. Furthermore, this research can provide insight tailored to improve drug addiction treatment protocols and enhance current prevention, management, and treatment of the ongoing opioid health crisis.

MATERIALS AND METHODS

This retrospective descriptive study presents a demographic profile of the opioid overdose population in Puerto Rico from 2020 to 2022. Frequencies and percentages across demographic groups were calculated, enabling the identification of risk categories associated with an increased incidence of opioid use and overdose. This study received approval from the Institutional Review Board (IRB) at the San Juan Bautista School of Medicine (EMSSJBIRB-5-2023).

A. Participants and Procedures

Anonymized data of the overdose profile of Puerto Rico in the years 2020- 2022 was directly provided by the Puerto Rico mental health and addiction subdivision of the Public Health Department (Administración de Servicios de Salud y Contra la Adicción; ASSMCA). ASSMCA translates to “Administration of Mental Health and Anti-Addiction Services”, and is responsible for overseeing mental health and addiction-related programs and services in Puerto Rico. This subdivision plays a critical role in addressing mental health and substance abuse issues within the territory. The data was exclusively handled by the principal investigators, adhering to stringent privacy protocols.

B. Data analysis

Data analysis was conducted using descriptive analysis tools such as means, frequencies, and percentages. The population and variables of interest were analyzed using descriptive analysis. Statistical analysis were performed using statistical software that is commercially available (i.e. R studio, SPSS, Excel).

RESULTS

Results in the following data set were extracted from 124 patients in 2020, 473 in 2021, and 713 in 2022, for a total of 1,310 patients.

Table 1 presents the demographics of seven variables: Gender, Age Group, Region, Town, Overnight stay, Place Of Overdose, And Time Of Day. Descriptive analysis revealed that in regards to gender, the majority of patients suffering from an overdose were male in 2020 (93.5%), a trend that continued in 2021 (88.8%) and 2022 (90.32%). Conversely, the proportion of females remained consistently lower in each respective year (6.5% in 2020, 10.8% in 2021, and 8.3% in 2022). Transgender individuals represented a minimal proportion, accounting for 0.2% of cases in 2021, 0.1% in 2022, and none in 2020. These results are displayed in **Figure 1**.

A plurality of participants were in the age group of 35-44 (29.8% in 2020, 29.2% in 2021 and 32.68% in 2022), followed by 25-34 (20.2% in 2022, 20.7% in 2021, and 23.84% in 2022). The minority of participants were 45-54 years old (20.2% in 2020, 22.2% in 2021, and 14.87% in 2022), as well as 55-64 years old (7.3% in 2020, 12.1% in 2021, and 11.6% in 2022). **Figure 2** displays these percentages.

Data analysis revealed that from the known information in 2020, most patients resided in the town of Vega Baja (29%), followed by Caguas (16.1%) and San Juan (12.9%). In 2021, the data demonstrated distributions of 17.8% for Caguas, 13.5% for San Juan, and 8.5% for Vega Baja. However, in 2022 the data showed the capital of San Juan was the most prominent town (14.7%), followed by Caguas (9.5%) and Ponce (6.2%).



Regarding regional location, most cases were from participants residing in the North (33.9% in 2020, 22.6% in 2021, 17.11% in 2022). However, the second most common region of Puerto Rico changed from the West, with 25% of cases in 2020 and 15.4% in 2022, to the East with 20.3% of cases in 2021. In the Southwest region, cases in 2020 and 2021 amounted to 7.3% and 2.1%, respectively. In 2022, there was a notable increase to 8.6% of the total. In the Southeast region, there were no cases in 2020. However, in 2021, there were 3% and in 2022 they increased to 4.6%.

Most participants reported their overnight stay being unknown across the years (48.4% in 2020, 54.5% in 2021, and 44.74% in 2022). The street was the second most common overnight stay for patients in 2020 (18.5%) and 2021 (19.5%). However, in 2022, it turned out to be their own home (22.02%), followed by the street (17.53%). Refer to **Figure 3**.

Most instances of overdose took place in open public areas, which remained constant throughout the studied years (60.5% in 2020, 67.7% in 2021, and 58.91% in 2022), with a growing trend of overdoses in private domiciles (14.5% in 2020, 12.9% in 2021, and 25.95% in 2022). **Figure 4** shows these distributions.

In terms of the time of day when the overdoses took place, there is a consistent trend across the years, with most cases reported between 12:00 pm - 5:59 pm (31.5% in 2020, 32.5% in 2021, and 36.33% in 2022). The second most common timeframe varied with 6:00 am - 11:59 am in 2020 (23.4%) and in 2021 (21.4%), and 6:00 pm - 11:59 pm in 2022 (25.5%).

Table 2 shows the yearly distribution of specific opioid usage, naloxone usage, trained naloxone administrators, specific naloxone administrators, and naloxone doses used. Most of the reported cases of overdose were with fentanyl combined with other substances in 2020 (38.7%), and unknown substances for 2021 (42.3%) and 2022 (53.02%). The second most common substance was unknown for 2020 (35.5%), and fentanyl combined with other substances for 2021 (30.2%) and 2022 (20.76%). Heroin's prevalence seemed to be trending down, with 21.8% in 2020, 20.7% in 2021, and 17.1% in 2022. Fentanyl alone saw a growing trend with 4% in 2020, 4.2% in 2021 and then 7.2% in 2022. Prescription opioids were a noticeable minority, with only 2.5% in 2021 and 2% in 2022.

The majority of patients received treatment with naloxone across these years. The number of patients not receiving naloxone decreased, with 5.6% not receiving it in 2020, 5.5% in 2021 and 3.1% in 2022. Naloxone was mainly administered via intranasal route, consistent across the years (92.7% in 2020, 91.8% in 2021, and 76% in 2022). Intramuscular or intravenous routes of administration seemingly increased across the years, with 0.8% in 2020, 1.9% in 2021 and 20.6% in 2022.

From the reported cases, most naloxone administrators were medical emergency personnel (33.9% in 2020, 42.5% in 2021, and 63.8%), followed by friends (20.2% in 2020, 21.4% in 2021, and 20.1% in 2022). Family members constituted less than 2% across the studied years. Overall, trained naloxone administrators constituted 90.3% in 2020, 82.9% in 2021 and 40.8% in 2022.

The number of naloxone dosages used in each patient varied, primarily concentrating in the 1 to 2 dose range. In 2020 and 2021, most of the patients required 2 doses of naloxone (62.2% and 60.5% respectively), while in 2022 the majority of patients received 1 dose (60.2%).

Table 3 shows an overview of fatalities by year. In 2020 a total of 8 were reported, making a fatality rate of 6.4%. However, in only 1 case, naloxone was not administered. This is in contrast to the subsequent years, where in 2021, the fatality rate was 4.9%, with 16 out of the 23 cases lacking naloxone administration. In 2022, the fatality rate was 4.6%, and in 15 out of 33 fatality cases, naloxone was not administered.

Fentanyl and heroin consistently dominated overdose fatality cases from 2020 to 2022. In 2020, these substances were responsible for 50% of fatalities, with heroin alone contributing 37.5%. In 2021, fentanyl and heroin accounted for 48% of overdose fatality cases, while heroin alone caused 26%. In 2022, fentanyl and heroin were involved in 36% of fatalities, and heroin alone in 21%. A minority of cases during these years featured different substance combinations or unknown substances. Refer to **Figure 5**.

DISCUSSION

By examining significant variables in the recorded cases from the ASSMCA database in the years 2020-2022, we identified distinct patterns with a mix of clear and nuanced trends. These findings will aid in identifying specific vulnerable groups and factors that could be used to implement targeted strategies for future prevention and efficient intervention of opioid overdoses in Puerto Rico.

Results revealed that a significant majority of overdose cases involved males in the three years analyzed, as **Figure 1** demonstrates. This gender discrepancy should be analyzed further to identify possible reasons for this pattern. Furthermore, higher male predominance in non-medical use of opiates was also found in the United States [8]. Gender differences could be attributed to



factors such as differences in substance use patterns, differences in treatment, socio-economic factors, or stigma associated with seeking medical help. As visualized in **Figure 2**, the majority of patients who suffered an overdose were constantly in the age ranges of 35-44 and 25-34. The affected population was predominantly younger, which suggests that a set of interventions and awareness campaigns could be put in place to reduce the number of incidents in this group. This finding is consistent with a previous study showing that the peak mortality burden from opioid overdoses in the U.S. has shifted in the last decade to a younger age group of 30-40 from the previous 40-59 age range [9]. Furthermore, the decline in patients in older age groups could indicate a change in substance use trends, an increased mortality rate associated with opioid drug usage, or a risk-taking behavior related to opioid drug usage.

Geographical analysis of the data reveals that most cases occurred in major metropolitan areas of Puerto Rico, such as San Juan and Caguas, over the three years reported. This pattern indicates that high population density and economic activity in these areas may contribute to easier access to illicit substances. These statistics are consistent with previous studies finding higher drug usage rates in larger metropolitan areas compared to smaller metropolitan and nonmetropolitan areas in the United States [10]. This information is essential in targeting areas with higher drug overdoses for allocation of resources, interventions, and adaptable healthcare strategies related to the prevention and treatment of opioid overdoses in Puerto Rico.

The majority of overdose cases took place in public, open spaces in all three years of data collection, and the second leading setting changed from public, closed spaces to private domiciles in the year 2022, as seen in **Figure 3**. The change in setting is significant since it could be a potential target for harm reduction strategies targeted to the home and the public setting. Moreover, throughout the three years, the most common overnight stay for these patients was unknown. Findings in this study parallel results by Yamamoto and colleagues, who found Individuals experiencing homelessness were at a higher risk of overdose by opiates as well as emergency department visits and hospital admissions compared to housed individuals in the United States [11]. These findings, coupled with the prevalence of overdose incidents in open public settings as seen in **Figure 4**, highlight the unstable living situations commonly associated with drug use.

An overwhelming majority of cases occurred during the 12 pm-5:59 pm time period across all years. The consistency of the time pattern of overdose cases could signify a similarity in daily routines and opioid drug use habits among drug users in Puerto Rico. Identification of the peak time of incidence is crucial since it could guide allocation of emergency response services during the times most in need.

Regarding the specific substance used, results showed that the percentage of heroin-related overdoses declined, while the percentage of cases involving fentanyl in combination with other substances increased over all three years. Fentanyl is characterized as having a higher potency and increased risk of overdose, and as such, interventions should be shifted to reduce the risk of overdose of such drugs. Fentanyl's higher risk of fatality is attributed to the increased risk of brain hypoxia due to respiratory depression caused by fentanyl's high affinity for mu-opioid receptors in the pontine area of the brain [12]. Furthermore, as **Figure 5** demonstrates, the percentage of unknown substance overdose increased over all three years; this could be attributed to an inability to properly document the history intake of patients experiencing an overdose.

Most patients received intranasal naloxone, and there was a decrease in the percentage of patients not receiving naloxone. Also, there was an increase in the percentage of patients receiving intramuscular naloxone in 2022. Most of the instances of naloxone administration were done by emergency medical personnel, followed by administration by a friend. Furthermore, there was an overall decrease in the percentage of trained naloxone administrators throughout the years. These findings highlight the importance of naloxone administration training and over the counter naloxone availability to the public to provide appropriate intervention in the time of need. A 2015 review of opioid overdose prevention and naloxone use found that not only is naloxone use cost-effective in healthcare administration but that many developed countries, including Norway, Sweden, Germany, Italy, Australia, and Canada, have begun robust naloxone distribution and education programs [13].

There was much variation in the naloxone doses used in drug overdoses, although the predominant dosages were 1 and 2 dosages in the years recorded. Further research could identify factors influencing the required doses to allocate resources more efficiently. The trend displays a reduction in the percentage of mortality cases over the three years recorded. While there was a reduction in the rate of fatalities with naloxone use from 2020 to 2021, the percentage increased in 2022. This finding suggests that naloxone played a role in the reduction of deaths in the year 2021; this highlights the importance of naloxone usage to reduce deaths in opioid-related deaths.



Furthermore, heroin and fentanyl played a major role consistently in deaths related to overdose. This is consistent with toxicology data from the United States, specifically in the state of Maryland, where opioid overdose fatalities for the years 2016-2018 demonstrated fentanyl involvement in 71% of the cases, with a majority (76%) involving multiple substances [14]. These findings highlight the importance of access to treatment and targeted interventions to address the use of these substances.

There are several limitations of this study. First, the overdose events recorded do not represent the totality of overdoses, as they are data reported only by individuals affiliated with the ASSMCA organization; thus, it could underestimate the number of overdoses and possibly deaths related to opioids in Puerto Rico. Second, overdose deaths have not been certified by the Puerto Rico Forensic Sciences Institute. Third, data on morbidity could be confounded by multiple substance use disorders where opioids may not be the main culprit but merely add to a greater picture of high-risk behavior. Fourth, the data collection program used for this study is an evolving process; with time, more personnel and training protocols have been developed since the beginning of data collection in late 2019. Thus, the year 2022 had more cases to be analyzed, which might reflect a more efficient data-collecting system, not necessarily more cases.

CONCLUSION

Puerto Rico and the United States are facing a recent opioid epidemic. Data from the Puerto Rico Department of Health for 2020-2022 reveals a predominantly male opioid use pattern, primarily concentrated in the 35-44 age group, specifically in urban areas among those living in unstable arrangements. These trends align with the data from the United States. The prevalence of unknown substances and fentanyl among the overdose cases indicates a higher risk of adverse outcomes due to the unpredictability of the purity, dosing, and manufacturing process of illicit substances. Naloxone's importance was also underscored, highlighting the need for more education and access to improve its availability and reduce mortality.

TABLES AND FIGURES

Table 1: Demographics Per Year of Participants Based on The Following Seven Demographic Variables: Gender, Age Group, Place of Overdose, Region, Town, Overnight Stay, and Time of Day. (N=1,310)

<i>Gender</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>
Male	116 (93.5%)	420 (88.8%)	644 (90.3%)
Female	8 (6.5%)	51 (10.8%)	59 (8.3%)
Other	0	1 (0.2%)	9 (1.3%)
Transgender	0	1 (0.2%)	1 (0.1%)
Age			
15-24	5 (4%)	33 (7%)	44 (6.2%)
25-34	25 (20.2%)	98 (20.7%)	170 (23.8%)
35-44	37 (29.8%)	138 (29.2%)	233 (32.7 %)
45-54	25 (20.2%)	105 (22.2%)	106 (14.9%)
55-64	9 (7.3%)	57 (12.1%)	83 (11.6%)
65+	3 (2.4%)	15 (3.2%)	21 (2.9%)
Unknown	20 (16.1%)	27 (5.7%)	56 (7.9%)
Region within Puerto Rico			
West	31 (25%)	76 (16.1%)	110 (15.4%)
Northeast	1 (0.8%)	93 (19.7%)	69 (9.7%)
North Metropolitan	5 (4%)	13 (2.7%)	109 (15.3%)
North	42 (33.9%)	107 (22.6%)	122 (17.1%)
East	20 (16.1%)	96 (20.3%)	104 (14.6%)
San Juan	16 (12.9%)	64 (13.5%)	105 (14.7%)
Southwest	9 (7.3%)	10 (2.1%)	61 (8.6%)
Southeast	0	14(3%)	33 (4.6%)
Town			



San Juan	16 (12.9%)	64 (13.5%)	105 (14.7%)
Caguas	20 (16.1%)	84 (17.8%)	68 (9.5%)
Ponce	3 (2.4%)	2 (0.4%)	44 (6.2%)
Bayamón	4 (3.2%)	9 (1.9%)	42 (5.9%)
Vega Baja	36 (29%)	40 (8.5%)	42 (5.9%)
Overnight stay			
Friend or family member	20 (16.1%)	37 (7.8%)	78 (10.9%)
Street	23 (18.5%)	92 (19.5%)	125 (17.5%)
Own home	19 (15.3%)	59 (12.5%)	157 (22%)
Unknown	60 (48.4%)	258 (54.5%)	319 (44.7%)
transitional home	0	12 (2.5%)	13 (1.8%)
Shelter	1 (0.8%)	7 (1.5%)	8 (1.1%)
Other	1 (0.8%)	8 (1.7%)	9 (1.3%)
Penal institution	0	0	4 (0.6%)
Place			
Public/open space	75 (60.5%)	320 (67.7%)	420 (58.9%)
Public/closed space	20 (16.1%)	41 (8.7%)	74 (10.4%)
Private domicile	18 (14.5%)	61 (12.9%)	185 (25.9%)
Unknown	11 (8.9%)	51 (10.7%)	34 (4.8%)
Time of day	2020	2021	2022
12:00am - 5:59am	1 (0.8%)	39 (8.2%)	56 (7.9%)
12:00pm - 5:59pm	29 (23.4%)	101 (21.4%)	142 (19.9%)
6:00pm - 11:59pm	39 (31.5%)	154 (32.6%)	259 (36.3%)
6:00am - 11:59am	19 (15.3%)	98 (20.7%)	182 (25.5%)
Unknown	36 (29%)	81 (17.1%)	74 (10.4%)

Table 2: Distribution Per Year Of Opioid, Naloxone Usage, Trained and Specific Naloxone Administrators, And Naloxone Doses Used. (N=1,310)

<i>Opioid used</i>	2020	2021	2022
Fentanyl	5 (4%)	20 (4.2%)	51 (7.2%)
Fentanyl and other	48 (38.7%)	143 (30.2%)	148 (20.8%)
Heroin	27 (21.8%)	98 (20.7%)	122 (17.1%)
Unknown	44 (35.5%)	200 (42.3%)	378 (53%)
Prescription opioids	0	12 (2.5%)	14 (2%)
Naloxone usage			
Intranasal	115 (92.7%)	434 (91.8%)	542 (76%)
IV or IM	7 (5.6%)	26 (5.5%)	22 (3.1%)
unknown route of administration	1 (0.8%)	9 (1.9%)	147 (20.6%)
None used	1 (0.8%)	4 (1.9%)	2 (0.3%)
Trained Naloxone administrator			
yes	112 (90.3%)	392 (82.9%)	291 (40.8%)
no	1 (0.8%)	8 (1.7%)	9 (1.3%)



unknown	3 (2.4%)	39 (8.2%)	28 (3.9%)
Unreported	8 (6.5%)	34 (7.2%)	385 (54%)
Naloxone administrator			
Medical Emergency	42 (33.9%)	201 (42.5%)	455 (63.8%)
Citizen (Civil)	26 (21%)	110 (23.3 %)	38 (5.3%)
Family member	2 (1.6%)	4 (0.8%)	2 (0.3%)
Self	7 (5.6%)	8 (1.7%)	8 (1.1%)
Friend	25 (20.2%)	101 (21.4%)	143 (20.1%)
Unknown	2 (1.6%)	19 (4%)	27 (3.8%)
Other	9 (7.3%)	3 (0.6%)	12 (1.7%)
Police	4 (3.2%)	0	1 (0.1%)
Naloxone dosage			
	2020	2021	2022
0	7 (5.9%)	19 (4.5%)	12 (1.7%)
1	33 (27.7%)	139 (33.1%)	418 (60.2%)
2	74 (62.2%)	254 (60.5%)	237 (34.1%)
3	1 (0.8%)	3 (0.7%)	18 (2.6%)
4	3 (2.5%)	4 (1%)	6 (0.9%)
5	0	0	2 (0.2%)
8	1 (0.8%)	1 (0.2%)	0
Not reported	0	0	1 (0.1%)

Table 3: Overview of Fatalities, Naloxone and Specific Opioid Use in Fatality Cases (N=1,310)

<i>Fatalities</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>
Total Fatalities	8(6.4%)	23 (4.9%)	33 (4.6%)
Naloxone use			
Fatalities WITHOUT naloxone use	1 (12.5%)	16 (69%)	15 (45%)
Fatalities WITH naloxone use	7 (87.5%)	7 (30%)	18 (55%)
Specific opioid used			
Fentanyl and heroin	4 (50%)	3 (37.5%)	1 (12.5%)
Heroin alone	11 (47.8%)	6 (26%)	1 (4.3%)
Fentanyl alone	12 (36.7%)	7 (21.2%)	3 (9.1%)

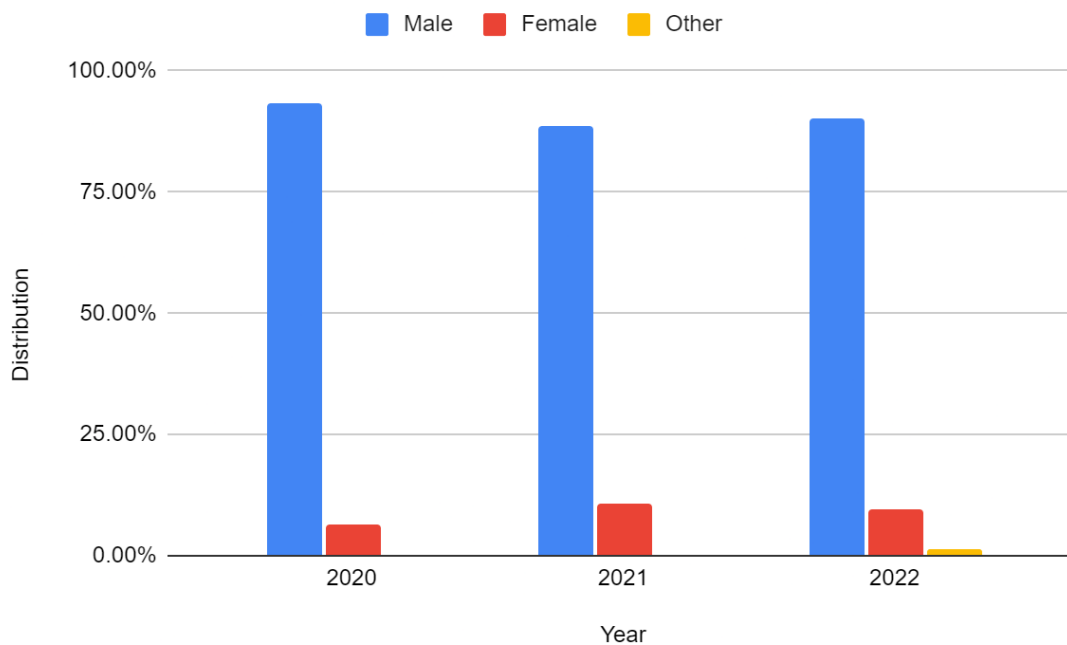


Figure 1: Frequency of Overdose by Gender by Year

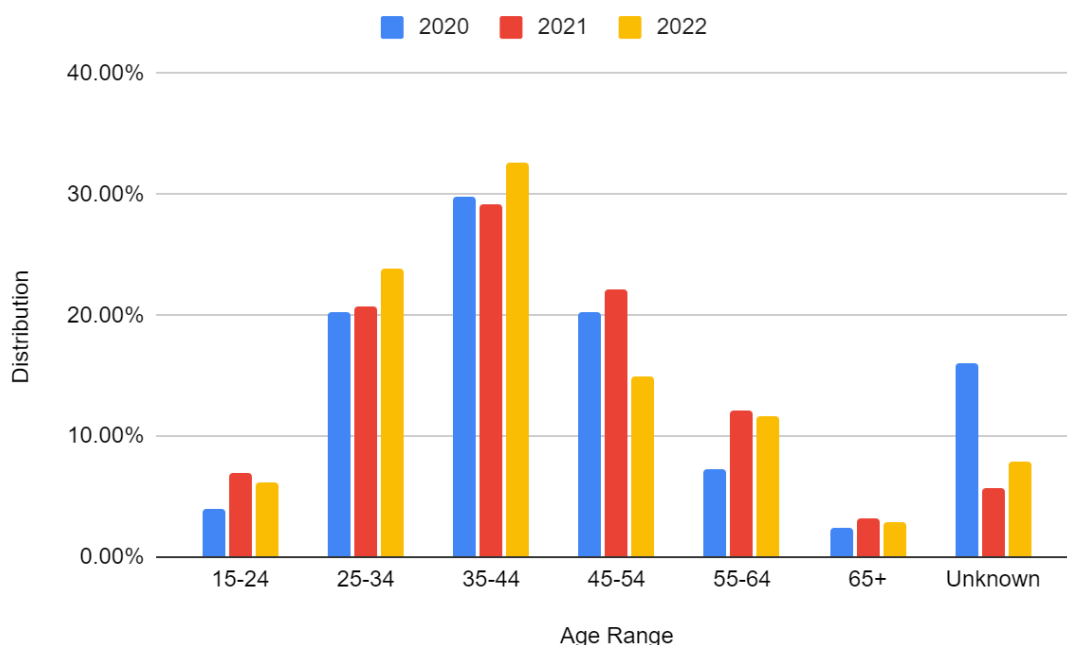


Figure 2: Frequency of Opioid Overdose by Age Group by Year

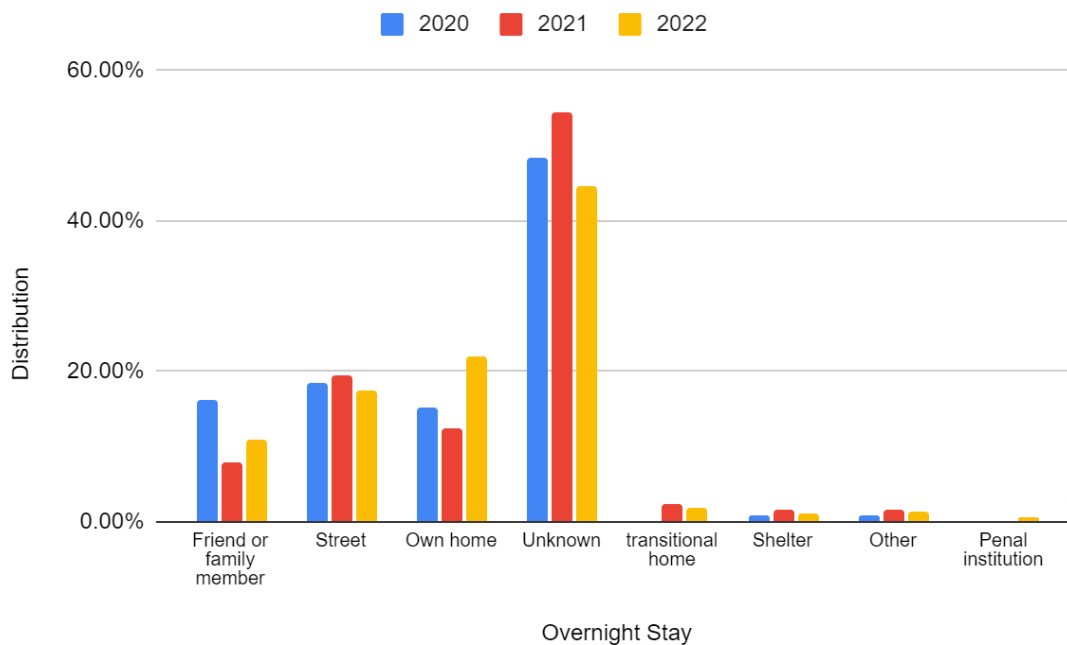


Figure 3: Frequency of Opioid Overdose by Overnight Stay by Year

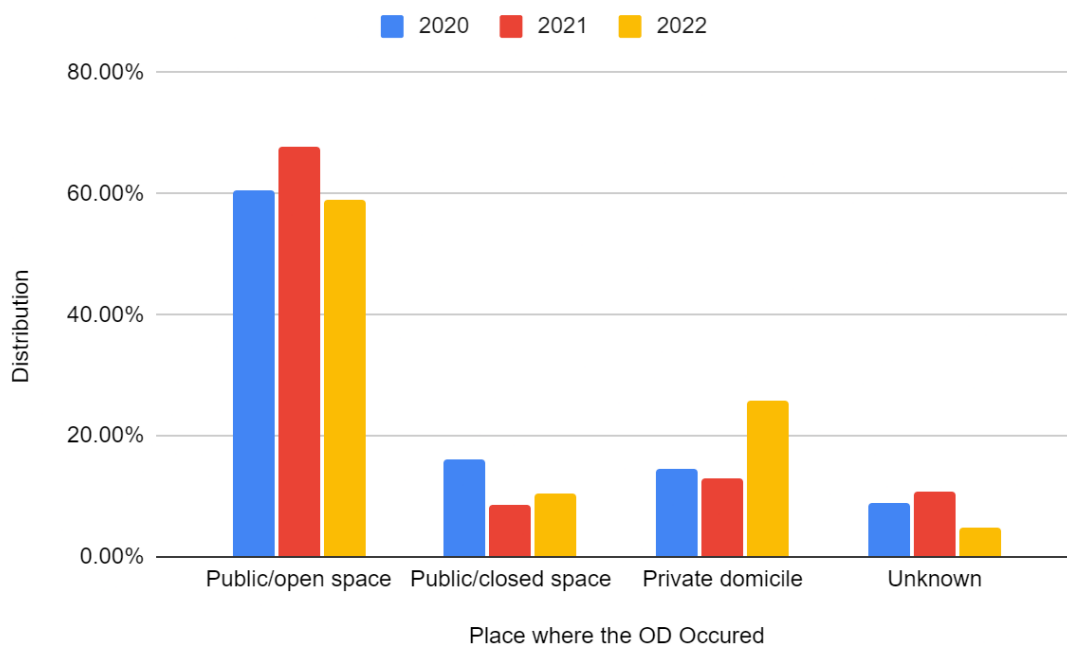


Figure 4. Frequency Of Opioid Overdose by Place (Public/Private) by Year

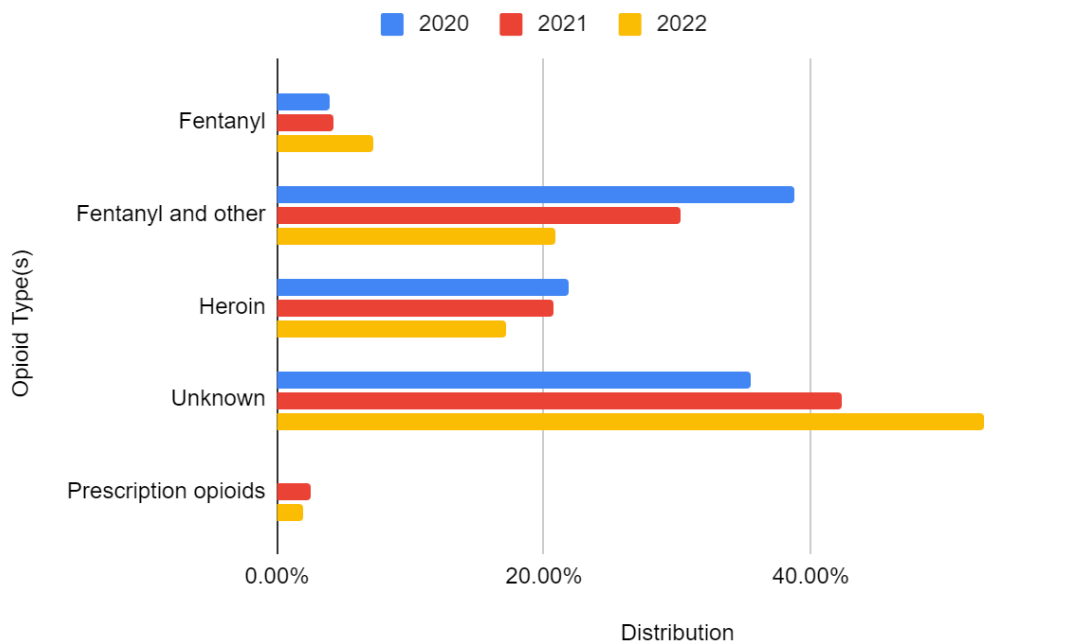


Figure 5. Type of Opioid Used by Year

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