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Unintentional Fatal Overdose Analysis in Orange County, FL Yearly Trends 2018-2022

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Introduction

This report aims to analyze yearly trends in unintentional fatal overdoses in Orange County, FL. Like many other parts of the country, the Central Florida area continues to suffer from a high number of overdose mortalities. As such, this report analyzes unintentional fatal overdoses across the years 2018-2022, focusing on the variables of sex, race, age, drug toxicology, victim residency information, and death location to draw conclusions on Orange County's overdose climate and identify any changes over time. Additionally, we analyze quarterly trends within each calendar year, and estimate overdose rates in regard to county population by using publicly available county Census data.

Data Source and Analysis Method

To begin, data were obtained from the Orange County Medical Examiner. This dataset includes all documented cases of unintentional fatal overdoses in Orange County, FL from the years 2018-2022 including the personal and demographic characteristics of the victim (when known), cause of death, location of death, and type of drugs found in the victim's system.

Descriptive statistics were run in SPSS, a statistical software, for each individual calendar year as well as the full time period on the variables measuring sex, race, age at time of death, victim's address, and location of death. The toxicology reports were coded into a quantitative variable to allow for statistical analysis. Additionally, each victim's address was mapped to identify the census tract of their home address.

Analysis Results

Between 2018-2022, the county had 2,161 unintentional fatal overdoses (Table 1 and Figure 1).

Table 1. Overall Fatal Overdoses by Year

Year	Number	Percentage
2018	346	16
2019	365	16.9
2020	449	20.8
2021	539	24.9
2022	462	21.4
Total	2161	100

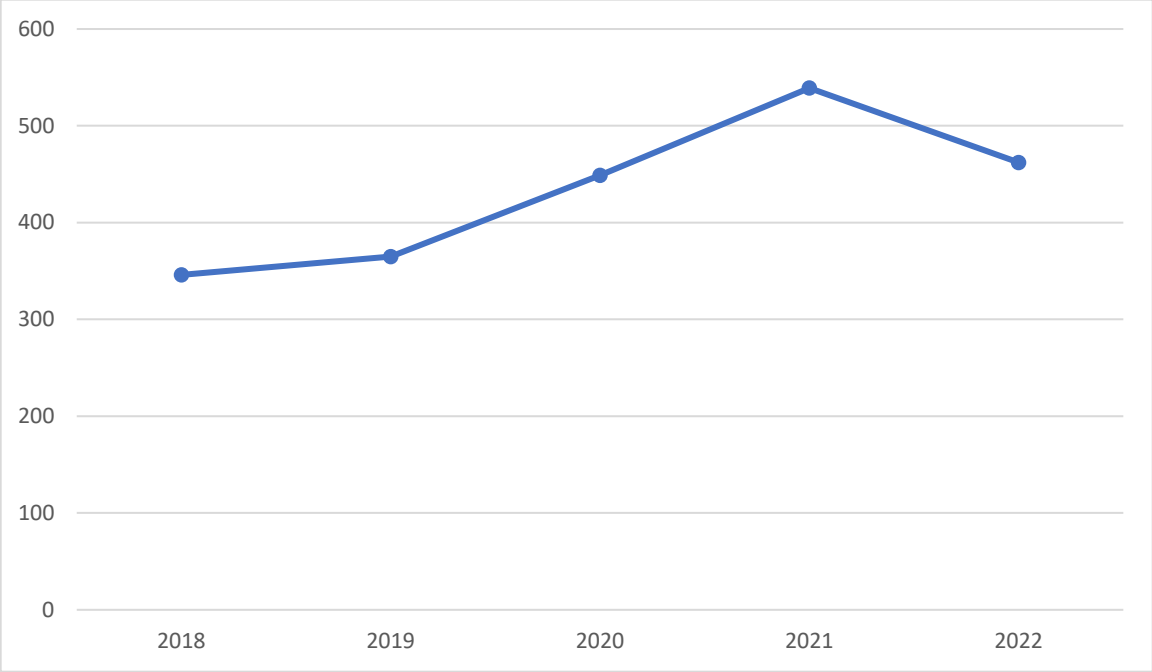

Figure 1: Fatal Overdoses by Year

Unintentional overdose deaths increased every year from 2018-2021, increasing from 346 cases in 2018 to 539 in 2021; 2021 has the highest percentage and number of total overdoses in the calendar years of the study, accounting for nearly 25% of fatal overdoses in Orange County

between 2018-2022. The number of deaths decreased slightly in in 2022, even as Orange County population increased (See Table 2 for estimated overdose rates per 1,000 population).

Table 2. Estimated Unintentional Fatal Overdose Rates per 1,000 Population

Year	Estimated Population	Total # Overdoses	Estimated Rate per 1,000
2018	1,384,000	346	0.25
2019	1,395,000	365	0.26
2020	1,404,000	449	0.32
2021	1,423,000	539	0.38
2022	1,452,000	462	0.32

Note: Rates rounded to nearest hundredth place value.

The population has increased every year in Orange County over the five years of focus. The largest increases in overdose rates per 1,000 can be observed between 2019 and 2020 (+0.06), as well as 2020 and 2021 (+0.06). In 2022, overdose rates dropped (-0.06), even though the county population increased, indicating that unintentional fatal overdoses have decreased both in raw number and in terms of the rate per capita, a trend we hope to see continue.

Trends in overdose deaths were calculated for each quarter to identify any seasonal differences (Table 3). The quarters analyzed follow the calendar year: Quarter 1 from January to March, Quarter 2 from April to June, Quarter 3 from July to September, and Quarter 4 from October to December.

Table 3. Analysis of Annual Overdose Mortalities by Quarter

Year	Q1	Q2	Q3	Q4
2018	**29.8** (103)	22.3 (77)	21.4 (74)	26.6 (92)
2019	21.1 (77)	20.8 (76)	24.7 (90)	**33.4** (122)
2020	21.8 (98)	26.1 (117)	**26.9 (**121)	25.2 (113)
2021	25.2 (136)	**29.5** (159)	24.5 (132)	20.8 (112)
2022	23.2 (107)	**26.4** (122)	24.7 (114)	25.8 (119)

Note: Percentage (n)

The highest quarterly percentage in each calendar year are bolded. There does not seem to be a consistent pattern regarding overdoses by quarter in Orange County, with each year having more overdoses in different quarters, except for years 2021 and 2022, where the highest percentage of overdoses occurred in quarter 2 in both years. The time of year does not seem to be a very important factor regarding unintentional fatal overdoses. Additionally, the variation in percentage of victims in each quarter was relatively consistent, with all percentages falling somewhere in the 20%-34% range.

Sex

Males were disproportionately more affected by unintentional fatal overdose in Orange County, FL during each year of study (Table 4).

Table 4. Sex Breakdown of Overdose Victims

Year	Male	Female	Total
2018	76 (263)	24 (83)	100 (346)
2019	76 (278)	24 (87)	100 (365)
2020	78 (351)	22 (98)	100 (449)
2021	80 (432)	20 (107)	100 (539)
2022	79 (365)	21 (97)	100 (462)
Total	78 (1689)	22 (472)	100 (2161)

Note: Percentage (n)

Like the overall trends in overdose deaths in the county, deaths among both males and females gradually rose from 2018-2021, then dropped in 2022. The percentage ratio of male to female victims did not change significantly, with males consistently accounting for approximately 76%-80% of victims each year. However, both sexes experienced similar yearly trends, with overdoses peaking overall in 2021.

Race

In the data provided from the Medical Examiner's Office, race is coded as "White," "Black," or "Other" (Table 5). Victims who do not have a race indicated within the dataset are excluded from analysis here. It is also important to note that no data for ethnicity are available in the data provided. **Therefore, we are unable to assess trends among the Hispanic/Latino population.**

Table 5. Race Breakdown of Overdose Victims

Year	White	Black	Other	Total
2018	83.5 (288)	15.4 (53)	1.2 (4)	100 (345)
2019	87.6 (317)	10.5 (38)	1.9 (7)	100 (362)
2020	79.0 (354)	15.8 (71)	5.1 (23)	100 (448)
2021	79.2 (418)	16.7 (88)	4.2 (22)	100 (528)
2022	81.4 (376)	17.1 (79)	1.3 (6)	100 (461)
Total	81.8 (1753)	15.3 (329)	2.9 (62)	100 (2144)

Note: Percentage (n); Missing cases excluded

Across each racial category, the patterns differ slightly from the overall trends and from one other. For instance, the percentage of White individuals who died decreased between 2019 and 2020 (-8.6%) and only rose .2% in 2021. The highest percentage of White victims in proportion to all races within a year is observed in 2019, with percentages decreasing in 2020, remaining relatively stagnant in 2021, and slightly rising again in 2022. Comparatively, overall overdose (N) trends show a peak in 2021, but for victims who are White, there were a significantly smaller percentage in 2021 (79.2%), even when the actual N value of victims was still increasing for each year until 2022. The actual number of White victims follows a similar trend to the overall overdose trends, with the number of White victims increasing each year from 2018-2021, then dropping in 2022.

The decreasing percentage of White victims between 2019 and 2020 indicates that the total overdose numbers and percentages of overall victims for each year among people of other

racial identities were increasing. In the case of Black individuals, both N values and percentage of cases within that race category decreased between 2018 and 2019, with a relatively large increase in percentages (+5.3%) and N value (+33) in 2020, a peak of overall deaths among Black victims in 2021 (n=88), and a peak in the percentage of Black victims in 2022 (17.1%). Therefore, while the actual number of Black victims followed similar patterns to the overall overdose trends, the ratio of Black victims to victims of other races did not follow this trend. In comparison to the percentage of White individuals, the percentage of Black individuals who died of overdose has increased since 2019 each year.

The category "Other" encompasses any victim who is not Black or White, and additional detail on racial or identity is not provided. As such, trends are more difficult to analyze. However, the highest percentage and overall numbers observed within this category was in the years 2020 and 2021, with significantly fewer victims in this category observed in the years 2018, 2019, and 2022.

Orange County census data was used to calculate the estimated overdose rate per 1,000 based on the Black population in Orange County (Table 6). According to the CDC (2022), Black individuals saw a historic increase in overdose death rates across the nation in 2020 (+44% per 100,000 people), therefore we calculated overdose rates for the Black population alone to see if this same trend was consistent with Orange County. Because Census data is not yet available for 2022, the year 2022 is excluded from these analyses.

Table 6. Overdose Rates per 1,000 of Black Population

Year	Estimated Black Population	Total # Overdoses	Estimated Rate per 1k population
2018	288,018	53	0.18
2019	296,070	38	0.13
2020	288,370	71	0.25
2021	284,003	88	0.31
2022	-	79	-

Note: Rates rounded to nearest hundredth place value.

The Black population saw the largest overdose rate increase from 2019 to 2020 (+0.12), showing a consistent trend of overdose rate increases in 2020 with Black individuals nationwide, even as the population also went down in 2020. The lowest overdose rate across this population within the years of 2018-2022 was in 2019, where the Black population was also the highest, according to Census estimates. The highest overall overdose rate among the Black population can be observed in the year 2021 (0.31).

Overall, when looking at race, White individuals were the most affected by unintentional fatal overdose in Orange County in every year of study. Their overall numbers were the highest every year, and they saw a consistent increase of overall numbers until 2022, where their overall numbers dropped.

Mean Age

The mean age of victims remained extremely consistent across the five years of focus (Table 7). The mean age of overdose death is consistently in the early 40s, with the lowest mean age in 2018 (42.82) and highest in 2019 (43). The standard deviation for age always remained above 12 and below 13 in each year. The age range was more inconsistent, with 2018 and 2022 having the largest age range of the fatal overdose victims, and 2019 having the smallest age range of the fatal overdose victims.

Table 7. Descriptive Statistics of Age in Overdose Victims

Year	Mean Age (s)	Range	N
2018	42.24 (12.64)	1-75	346
2019	42.99 (12.62)	18-74	362
2020	42.78 (12.77)	16-74	449
2021	42.37 (12.32)	17-81	539
2022	42.71 (12.11)	5-76	462

Note: Decimals rounded to nearest hundredth.

Drug Type

Toxicology information is provided as textual data from the Medical Examiner for each victim. To facilitate statistical analysis, this information was coded into a variable with 6 categories. Three of the categories measure a single drug while the remaining three measure poly-substance use. The categories are: 1. Fentanyl only, 2. Non-fentanyl opioid only, 3. Single, non-opioid drug, 4. Polysubstance use with fentanyl, 5. Polysubstance use with non-fentanyl opioid, 6. Polysubstance use, no opioids. Table 8 shows the yearly trends regarding the type of drugs that caused the death of the victim, and/or that were found in their system. Figure 2 below shows the yearly trends of the drug categories, illustrating the percentage of each drug type within that year rather than showing the overall N values.

Table 8. Annual Breakdown of Drug Toxicology

Year	Fentanyl	Opioid	Other	Polysubstance Fentanyl	Polysubstance Opioid	Polysubstance Other
2018	14.3 (49)	5.8 (20)	20.2 (69)	47.4 (162)	9.1 (31)	3.2 (11)
2019	20.5 (75)	4.4 (16)	17.0 (62)	46.3 (169)	8.8 (32)	3.0 (11)
2020	21.4 (95)	1.8 (8)	12.6 (56)	56.2 (249)	5.0 (22)	2.9 (13)
2021	23.9 (128)	1.5 (8)	12.1 (65)	55.4 (297)	3.5 (19)	3.5 (19)
2022	20.4 (94)	1.1 (5)	17.6 (81)	53.5 (246)	3.7 (17)	3.7 (17)
Total						

Note: Percentage (N)

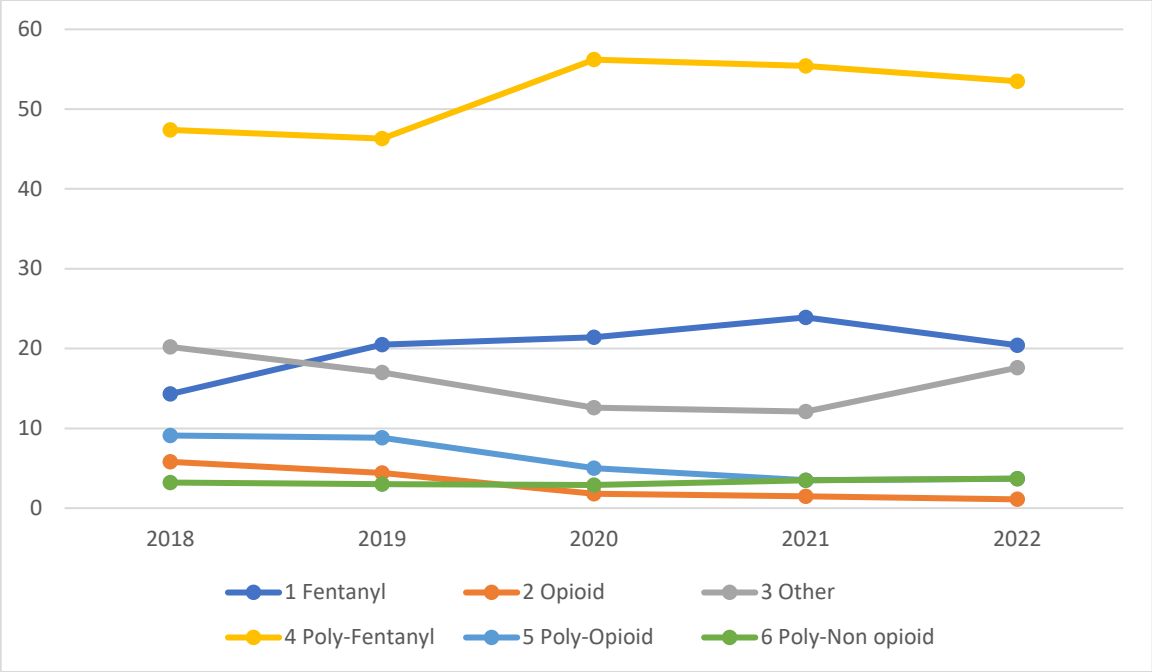

Figure 2. Drug Category Trends Overtime

As can be seen in Table 8, approximately half or more than half of all overdose mortalities in Orange County from 2018-2022 were attributed to polysubstance use that was fentanyl-involved. Fentanyl-involved polysubstance related deaths rose each year from 2018-2020, before slightly declining in both overall cases and percentage in 2021 and 2022. Deaths that involved only fentanyl followed a similar pattern, where they increased gradually from 2018-2021, and dropped off slightly in 2022. In both the opioid only and polysubstance opioid categories, it can be observed that both overall numbers and percentages have been slowly dropping overall each year since 2018, indicating that overdose mortality related to opioids besides fentanyl have gone down significantly in Orange County since 2018. The number of victims who had a single drug in the "other" category had gradually decreased from 2018-2021, but suddenly rose again in 2022. The polysubstance-other category saw very minimal change across the years of study, consistently making up approximately 3% of all fatal overdose cases

each year. Additionally, deaths from polysubstance use overall was far more prevalent than deaths from a single drug type.

Table 9 combines the drug categories to create three categories of observation: Fentanyl-involved deaths (Drug categories 1 and 4), Opioid-involved deaths (Drug categories 2 and 5), and Other drug/s (Drug categories 3 and 6).

Table 9. Role of Opioids; Combined N Drug Categories

Year	Fentanyl-Involved Overdose Deaths	Opioid-Involved Overdose Deaths (Non-Fentanyl)	Deaths from Other Drug/s Type
2018	211	51	80
2019	244	48	73
2020	344	30	69
2021	425	27	84
2022	340	22	98
Total N	1564	178	404

Note: Missing Cases Excluded

Fentanyl-involved deaths were overwhelmingly and unsurprisingly the most prominent type of death across drug categories. Fentanyl-involved deaths increased every year from 2018 to 2021, with a decline in 2022. Opioid-involved deaths that were not fentanyl-related went down in frequency each calendar year. Deaths that involved a drug/s that were not opioids ("other") did not have a consistent pattern. The number of deaths in this category decreased between 2018-2020, then increased from 2021-2022.

Location of Residency

Because of the high influx of visitors that Orange County receives every year, it is important to consider the victim's location of residency. All cases were categorized as residents of Orange County, residents of Seminole or Osceola counties (the two neighboring counties), from elsewhere in Florida besides those counties, out of state/county, or no address/missing

(Table 9). The majority of victims that did not have an address in the data were experiencing homelessness at the time of their death.

Table 10. County of Residence of Overdose Victims

Year	Orange	Seminole or Osceola	Elsewhere in FL	Out of State	No Address
2018	72.0 (249)	6.6 (23)	6.1 (21)	5.2 (18)	10.1 (35)
2019	71.5 (261)	3.8 (14)	9.0 (33)	5.8 (21)	9.9 (36)
2020	72.2 (324)	6.0 (27)	8.2 (37)	4.7 (21)	8.9 (40)
2021	72.4 (390)	5.9 (32)	8.0 (43)	5.4 (29)	8.3 (45)
2022	68.8 (318)	7.1 (33)	7.1 (33)	3.5 (16)	13.4 (62)

Note: Percentage (n)

Not surprisingly, most victims of unintentional fatal overdose in Orange County were residents of the county, making up approximately 69%-72% of overdose cases each year. Trends in victims from Seminole/Osceola and elsewhere are inconsistent. For example, the percentage of and total number of victims in 2019 who were residents of Seminole/Osceola county had decreased slightly since 2018, only to increase again in 2020. For victims who were residents of other counties in Florida, the overall numbers of cases increased gradually from 2018-2021, but the highest percentage of victims who were residents of other Florida counties was in 2019. Out of state/country residents also followed a relatively similar trend.

In 2022, there was a slight increase in overdose victims with no available address. Victims with no available address consistently make up 8.3% to 13.4% of the overall population across the years of analysis. This includes individuals who were confirmed homeless at time of death, as well as those who do not have a known address.

Location of Death

Analyzing the location of death can provide insight into the context of a fatal overdose. Considering the large diversity among death locations, each setting was coded into one of the following categories: Hospital, other medical setting, place of residence, hotel/motel, outdoors

(e.g. park), or other physical, public setting (e.g. place of business) to allow for a succinct inventory of death locations among unintentional overdose mortality victims (Table 11).

Table 11. Death Location Categorizations of Overdose Victims

Year	Hospital	Other Medical Setting	Place of Residence	Hotel/ Motel	Outdoors	Other Public Setting	No Address
2018	35.7 (122)	0.6 (2)	42.4 (145)	5.8 (20)	12.3 (42)	3.2 (11)	1.2 (4)
2019	32.9 (119)	1.4 (5)	46.4 (168)	10.0 (36)	3.6 (13)	5.8 (21)	0.8 (3)
2020	35.4 (159)	1.6 (7)	41.2 (185)	8.2 (37)	12.5 (56)	1.1 (5)	0 (0)
2021	30.7 (165)	1.1 (6)	44.4 (239)	11.0 (59)	11.2 (60)	1.7 (9)	0.2 (1)
2022	34.5 (157)	0.4 (2)	42.0 (191)	6.6 (30)	14.3 (65)	2.2 (10)	1.5 (7)

Note: Percentage (n)

For each calendar year, most overdoses occurred at places of residence, followed next by hospital settings. Trends were generally consistent in these categories, with places of residence accounting for 41.2% to 46.4% in any given year, and hospital settings accounting for 30.7% to 35.7%. The category of other medical setting was also relatively consistent, with a very small portion of the victims dying in another type of medical setting besides a hospital.

Deaths in hotels and motels fluctuated every year. Between 2018 and 2019, the number of overdose deaths in hotels and motels nearly doubled. The numbers also increased between 2020 and 2021, dropping again in 2022. Overdose deaths in outdoor settings also had an interesting pattern. In 2019, only 3.6% of overdose deaths occurred in an outdoor setting. However, in all other years, 11.2% or more of overdose deaths occurred in an outdoor setting.

Conclusion

Unintentional fatal overdoses have gradually risen in Orange County, FL, from 2018-2021, with a slight decrease in both overdose rates and actual number of cases in 2022. The year of 2021 saw the highest rates of overdose overall, as well as the highest rate of overdose when considering county population (Tables 1 and 2). It is unclear if overdoses have peaked in 2021

and will continue to decrease, or if overdose deaths will increase again in 2023. Additionally, the time of year did not seem to be an important factor regarding overdose deaths (Table 3).

Males consistently faced higher rates of overdose (Table 4). While the White population saw higher rates of overall overdose (Table 5), the Black population saw a large increase in overdose fatalities in the year of 2020 (Table 6), consistent with nationwide data. The mean age and standard deviation of age was consistent across all years, though the age range of overdose victims did vary (Table 7). Fentanyl alone and fentanyl-related polysubstance were the two biggest drivers in the overdose climate (Tables 8 and 9). Unsurprisingly, the majority of overdose victims were residents of Orange County (Table 10). Places of residence and hospitals had the highest number of overdose deaths (Table 11).

References

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