

OVERDOSE DATA TO ACTION (OD2A)

Fatal Overdose Surveillance Annual Report

Palm Beach County, 2021



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Visit [OvercomeOverdosePBC](https://www.floridahealth.gov/overdose) or scan the QR code to view past OD2A reports, hear real stories of recovery in Florida, and learn more about how OD2A is working with community partners to reduce overdose deaths in Palm Beach County. Together we can *overcome overdose*.

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UNDERSTANDING THE EPIDEMIC

THE EVOLVING EPIDEMIC

The Overdose Data to Action (OD2A) innovative surveillance project at the Florida Department of Health (FDOH) in Palm Beach County (PBC) aims to increase the surveillance of suspected drug overdoses and use that data to drive action, policy change, and community outreach. Surveillance of suspected drug overdose events in PBC can help the overdose epidemic by identifying clusters or areas of high drug overdose incidences, revealing more about the social determinants of substance use disorder, and can help identify novel substances or new trends in illicit drugs. The data collected through this surveillance initiative is designed to be shared with the PBC community, providing evidence to prevent overdose and promote early intervention for people with substance use disorder (SUD).

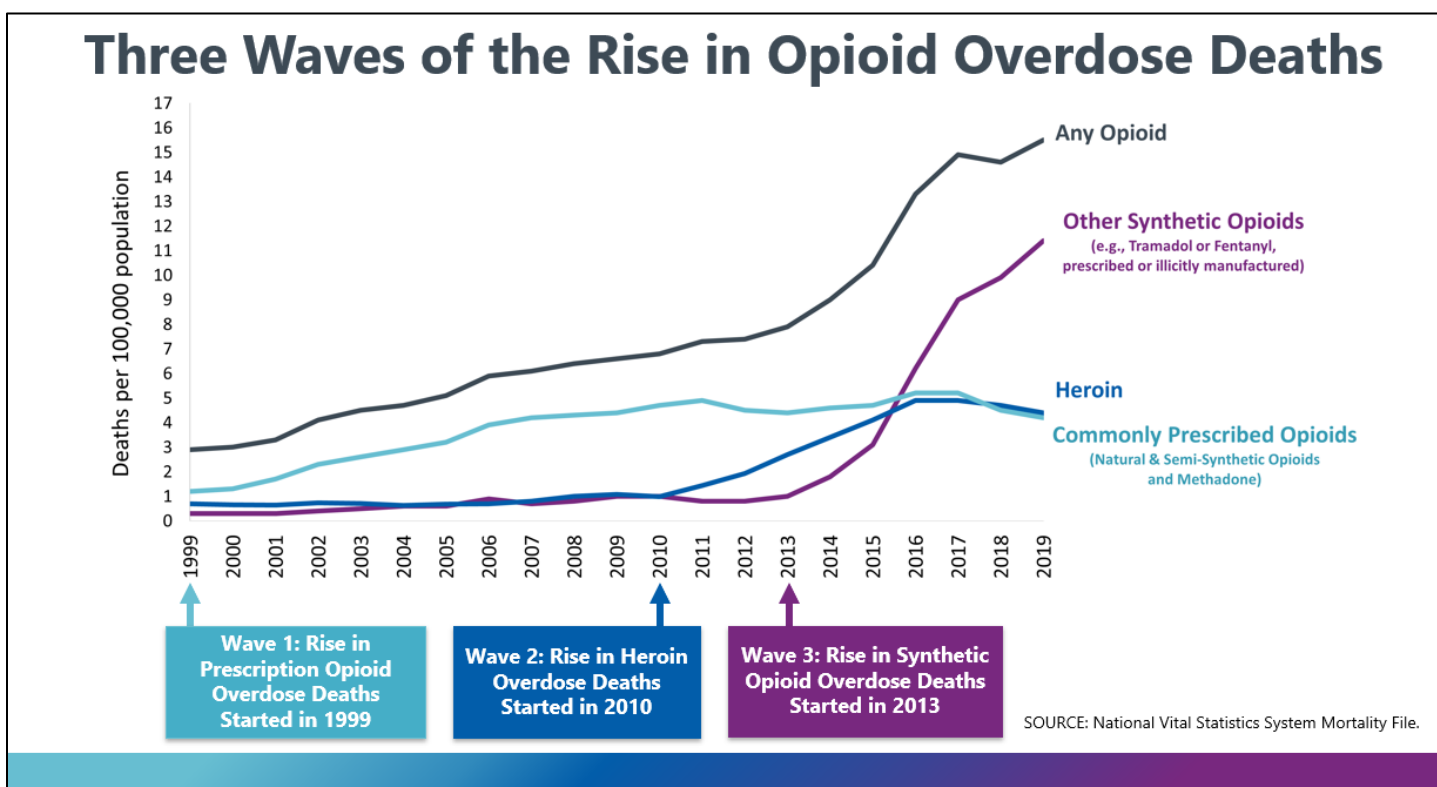


Image 1: Three Waves of the Rise in Opioid Overdose Deaths. Centers for Disease Control and Prevention (CDC). Accessed 2021, December 12, from <https://www.cdc.gov/drugoverdose/deaths/index.html>

EMERGING TRENDS

Wave 4 – Psychostimulants

In recent years, there has been a significant increase in the number of deaths due to psychostimulants¹. Psychostimulants are a broad category of drug that includes cocaine, methamphetamine, MDMA, and prescription stimulants like Adderall and Vyvanse. Stimulant-involved overdose deaths tend to disproportionately affect racial and ethnic minority groups. Use of psychostimulants together with opioids and the increasing presence of fentanyl-contaminated drugs are driving this new wave of overdose deaths.

SOCIAL DETERMINANTS OF HEALTH AND SUBSTANCE USE DISORDER

Social determinants of health (SDH) are the environmental conditions in which people are born, live, work, and play and have a broad impact on health and health outcomes^{2,3}. These circumstantial environmental factors in which people live their lives can positively or negatively affect health. SDH can be broadly categorized into five domains: education, healthcare, built environment, community, and economic stability. Understanding the effects of SDH can provide insight into the factors that influenced fatal overdoses.



Education Access and Quality. Studies have long shown that higher levels of education strongly correlate with an overall increase in health. Education and the environment in which a child learns can significantly affect both mental and physical health. While it is estimated that 40.6% of adults in Florida have less than or equal to a high school diploma⁴, data examined in the OD2A Annual Report showed that 58.7% of people who fatally overdosed in 2020 had less than or equal to a high school diploma.

Health Care Access and Quality. Many people in the U.S. do not receive the health care they need, and for people with SUD, that number may be higher. Data from the 2020 OD2A Annual Report⁵ found that over half (54.6%) of patients experiencing an overdose did not have health insurance. That is more than four times the estimate of the 12.9% of Floridians who were uninsured. Without health insurance, people with SUD might find difficulty accessing health services, including mental health and primary care, which can help treat SUD and prevent overdose. Their access to SUD treatment may also be limited, further hindering recovery.

Neighborhood and the Built Environment. The neighborhood and built environment provide a foundation for health outcomes. Access to clean water, healthful groceries, and outdoor recreation can have positive impacts on overall health. Neighborhoods with high rates of violence or illicit drug use can increase the risk of SUD.

Social and Community Context. The interpersonal relationships and interactions with a person's family, friends, co-workers, and community can all affect health and wellbeing. Adverse childhood experiences (ACEs), such as having one or more family members incarcerated, household violence and other dysfunction, and exposure to bullying at school can all negatively affect mental, physical, and social outcomes. The relationship between ACEs and SUD can be described as a dose-response relationship, in which higher cumulative ACEs are associated with higher risk of SUD and other poor health outcomes.

Economic Stability. Economic stability affects a person's ability to obtain stable housing, healthful foods, safe neighborhoods, and health care. People with SUD often have trouble maintaining employment due to the illness and are at greater risk for homelessness and unsafe housing.

PERSON-FIRST LANGUAGE

This report was designed to place the people in the forefront of the epidemic by using person-first language and medically accurate terms as often as possible to reduce stigma towards people with SUD. Stigma and stigmatizing language attach negative labels, stereotypes, and judgments to certain groups of people and can negatively affect health and wellness⁶. Stigma can come from many different sources including social stigma, structural stigma, and even self-stigma.

Using person-first language can be an excellent first step to combat stigma in all situations. Person-first language places the person in front of the condition, rather than defining them by their condition. This simple tool can be an effective reminder that people in our very own community have experienced overdose. The language we use when discussing these events may affect a person's perception of how others view them and how they view themselves.

Stigmatization often decreases a person's willingness to seek help, particularly when the stigma comes from healthcare professionals. By using neutral and non-judgmental person-first language, the emphasis is kept where it belongs – on the person and not their condition.



Table 1: Person-First Language and Terms

Recommended Language and Terms	Stigmatizing Language and Terms
person with a substance use disorder (SUD) person who uses drugs (PWUD)	drug addict, drug habit, junkie, user, drug abuser
person with law enforcement interactions person arrested for [x offense or violation]	criminal, drug offender
medication for opioid use disorder (MOUD)	replacement therapy, maintenance therapy
person who returned to substance use person who resumed substance use	relapse, slip
person in recovery	clean, straight, sober, former addict

INNOVATIVE OVERDOSE SURVEILLANCE FRAMEWORK

Substance use disorder is increasingly being recognized as a chronic disease that requires prevention, early intervention, and treatment. The most effective method to prevent morbidity and mortality from any disease is to prevent it from the start, also called primary prevention. As with receiving a vaccine to prevent measles, several factors can help prevent a person from developing a SUD later in life. For those with SUD, early intervention and treatment can help prevent overdose and/or death. Like many other chronic diseases (e.g., diabetes, cancer, and asthma), SUD can be treated and managed successfully.

Preventing and treating any illness is most effective when addressing the issue from a holistic perspective by considering the complex interactions between a person and their surroundings. The framework for PBC OD2A overdose surveillance incorporates all aspects of whole person health. It uses a multidisciplinary approach to examine the epidemic through individual factors, interpersonal relationships, community involvement, and societal barriers or solutions. This requires the consideration of the individual health behaviors and genetic makeup that influence health, but also the social and physical environments that account for an estimated 30-55% of health outcomes². Integrating this systems framework into overdose surveillance can add key prevention elements that might otherwise be overlooked.

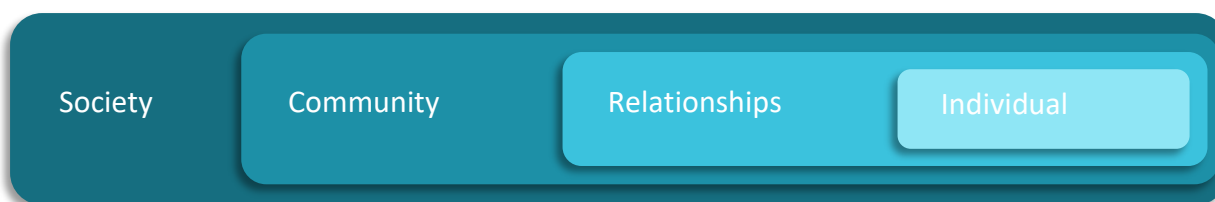


Image 3: Social-Ecological Model Framework for Factors that Influence Health and Health Outcomes

OVERDOSE SURVEILLANCE DATA

Data for the fatal overdose surveillance report was obtained primarily from the Palm Beach County Medical Examiner Office (PBC MEO). Data from this valuable partnership provided the foundation for this report.

- Innovative Surveillance – Integrated, In-Depth Review
 - > Fatal Overdose Medical Examiner Records
 - Patient-level mortality data obtained through MEO and FDOH Vital Statistics
 - Includes death certification information, doctor’s report, investigator notes, toxicology findings, and other details related to the event
 - > Prior Overdose Events
 - ED visits for suspected overdose
 - EMS calls for suspected overdose
 - > Other Relevant Information
 - Health data
 - Socioeconomic data
 - Social and ecological determinants of health
 - Criminal justice system data

Data obtained from various data sources allows for OD2A to look at the whole person, and not just at snap shots of a person’s life. All data is securely stored in compliance with HIPAA and FDOH health information standards. Details of methods of data procurement and analysis can be found in the Technical Notes section at the end of this report.

NOTES ON MAPS AND FIGURES

Before continuing, this section explains portions of the report that may be helpful in reading this report. Data presented in this report was collected, verified, and analyzed to the best ability of OD2A staff given the information available. Discrepancies between this report and others may exist, and this report should be considered provisional and is subject to change.



The Maps

Sections of the 2021 data in this report look at geographical distribution of overdoses per ZIP Code. Palm Beach County is the largest county in Florida by land mass, and the third largest by population. These conditions have resulted in a unique geographical distribution, which means some ZIP Codes can be small in size but large in population, while others can be large in size but small in population. For this reason, it is not useful to visualize overdose data in terms of raw values or counts per ZIP Code. For example, suppose ZIP Code A and B both reported 10 overdoses for 2021. Raw values might lead someone to believe the scope of the overdose epidemic is affecting both regions equally. ZIP Code A, however, has a total population of 100 people, whereas ZIP Code B has a population of 10,000 people. The rate at which overdoses occurred in these two ZIP Codes was significantly different. ZIP Code A had a proportion of 10 overdoses out of 100 population, or 0.1 (10%). ZIP Code B had a proportion of 10 overdoses out of 10,000 population, or 0.001 (0.1%). To make these numbers meaningful for readers, we multiply these proportions by a standard number across all ZIP Codes, typically by 100,000 people. This allows comparison between ZIP Codes of varying population sizes. After this statistical adjustment, ZIP Code A has an overdose rate of 10,000 per 100,000 population, and ZIP Code B has an overdose rate of 100 per 100,000 population. Overdoses that are adjusted to the population of each corresponding ZIP Code better reflect the burden experienced by each geographical area.

The Figures

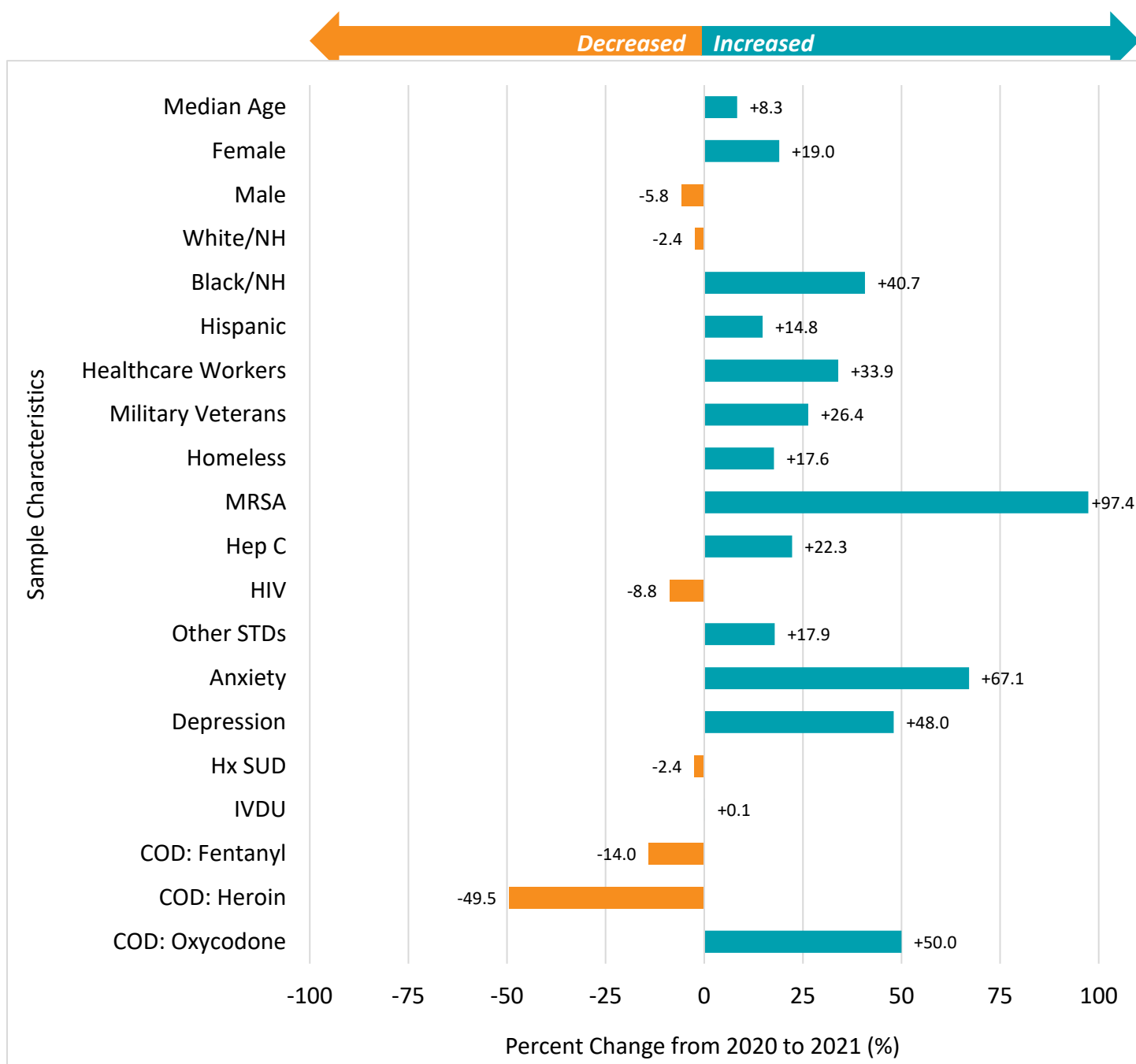
Fatal overdoses were included in this analysis if primary cause of death (COD) or contributing COD included at least one of the following substances: opioid, psychostimulants (“stimulants”) excluding caffeine and nicotine, benzodiazepine (“benzos”), or other illicit substances. Overdoses could involve more than one substance. Overdose deaths involving substances such as carbon-monoxide poisoning, alcohol, prescription medications, and OTC medications were not included unless accompanied by an opioid, stimulant, benzo, or other illicit substance. The figures and maps categorized by substance type in this report are not mutually exclusive unless otherwise stated. That is, the data does not account for polysubstance use (i.e., a person whose overdose involves a mixture of substances will be represented in each of those corresponding substance categories) unless explicitly stated.

Data presented in figures throughout this report are calculated in either count/frequency or percentage of total sample, or by subgroup (i.e., sex, race/ethnicity, etc.) if applicable. Furthermore, various data elements were restricted when an exceptionally low count for a subgroup occurred, most frequently of the racial/ethnic group “Other/NH.” This was done to ensure data remains de-identifiable and to prevent skewed data caused by the presence of outliers.

NOTABLE CHANGES FROM 2020 FATAL OVERDOSE REPORT

Notable changes made to the 2021 fatal innovative overdose surveillance report include the incorporation of overdose death for a larger variety of substances. In 2020, only opioid-involved overdoses were included in the OD2A innovative surveillance initiative. In 2021, the inclusion criteria incorporated a larger spectrum of substances including psychostimulant (“stimulants”), benzodiazepine (“benzos”), or other illicit substances. The figure below shows the percent change in the proportion of sample characteristics from 2020 to 2021. In contrast to the 2020 report, in which only opioid-involved substances were analyzed, the 2021 sample included opioid-involved overdoses (n=526, 91.2%) and non-opioid involved overdoses (n=51, 8.8%). Changes in sample characteristics presented in this report may be influenced by the expansion of overdose surveillance inclusion criteria.

Figure 1: Proportional Percent Change in Fatal Overdose Characteristics, 2020-2021



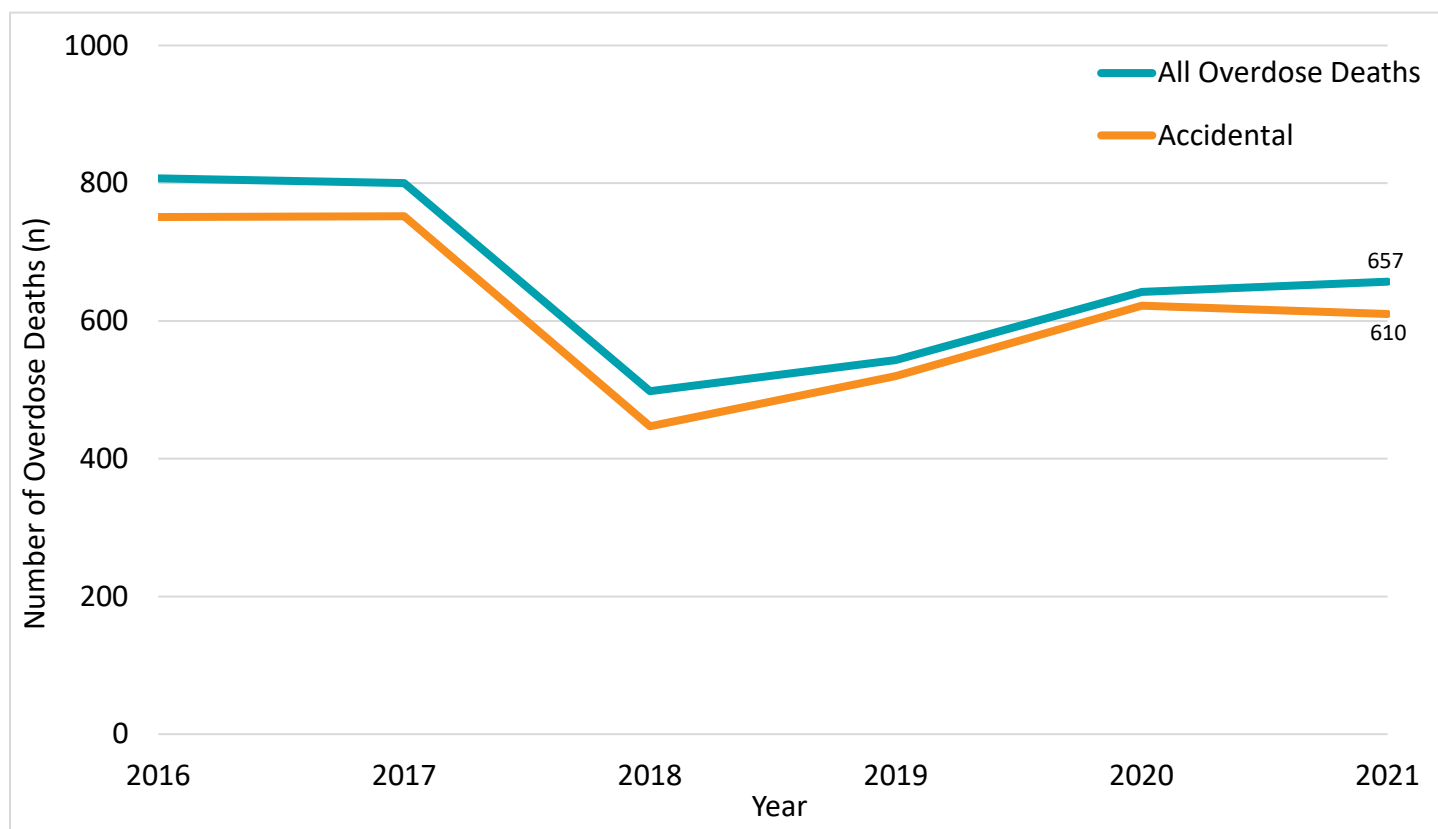
Note: COD = cause of death, non-mutually exclusive.

HISTORICAL TRENDS IN OVERDOSES

The figure below examines historical trends (2016-2021) in fatal overdoses that occurred in Palm Beach County. Data was obtained through the Palm Beach County Medical Examiner Officer (MEO) and FDOH Office of Vital Statistics for accidental overdose deaths and all overdose deaths (including intentional and undetermined manners of death). Deaths that occurred outside of Palm Beach County are not included in this report. Additional limitations of syndromic surveillance for overdose events can be found in the Technical Notes section at the end of this report.

Accidental drug overdose deaths decreased 1.9% from 622 in 2020 to 610 in 2021. Suicides by overdose, however, increased 147.1% from 17 in 2020 to 42 in 2021. Overall, deaths from overdose including accidental, suicide, and undetermined causes of death increased 2.3% from 642 in 2020 to 657 in 2021.

Figure 2: Overdose Trends in Palm Beach County, 2016-2021



QUICK STATS:

- Overdose deaths increased 2.3% from 2020 to 2021.
- 2021 had the highest number of overdose deaths since 2017.
- For every 100,000 people, 44 died from an overdose in 2021.
- An average of 1.8 people died each day in 2021.
- Suicides by overdose increased 147.1% from 2020.
- One of every four deaths involved a novel psychoactive substance.

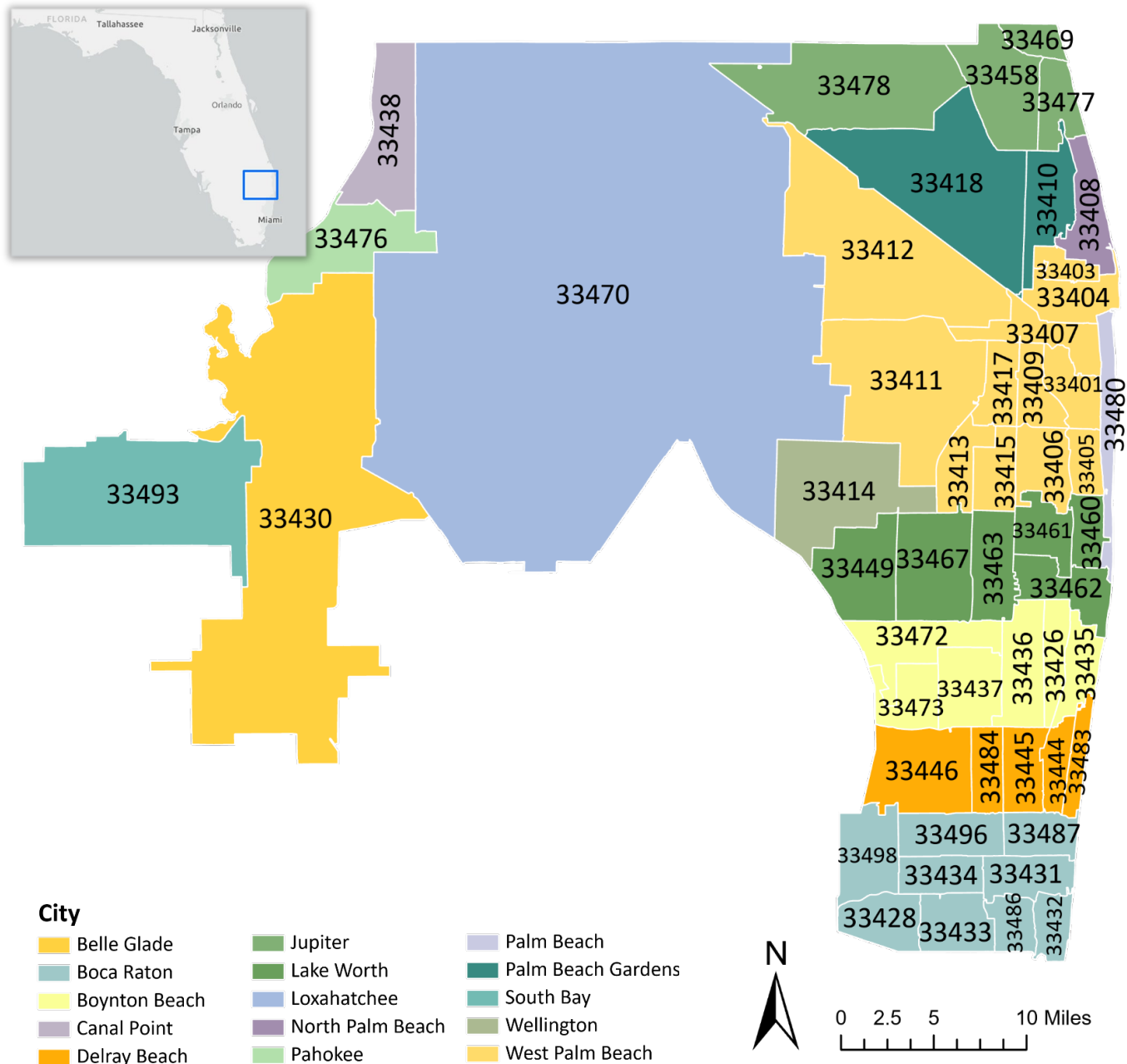


COUNTY CHARACTERISTICS

PALM BEACH COUNTY, FL

2021 Population Estimate: 1,497,987
 White (74.2%) Black (20.1%) Hispanic (23.9%)
 Median Household Income: \$65,015
 Persons Living in Poverty: 12.0%
 Source: U.S. Census Bureau⁷

Map 1: ZIP Code and City Boundaries of Palm Beach County, FL





2021 INNOVATIVE SURVEILLANCE RESULTS

Spatial data relating to overdose deaths is defined by two primary variables: where the person lived and where the person died. The follow two sections – “Overdose Deaths by Home ZIP Code” and “Overdose Deaths by Incident Location ZIP Code” – examine these two variables separately.

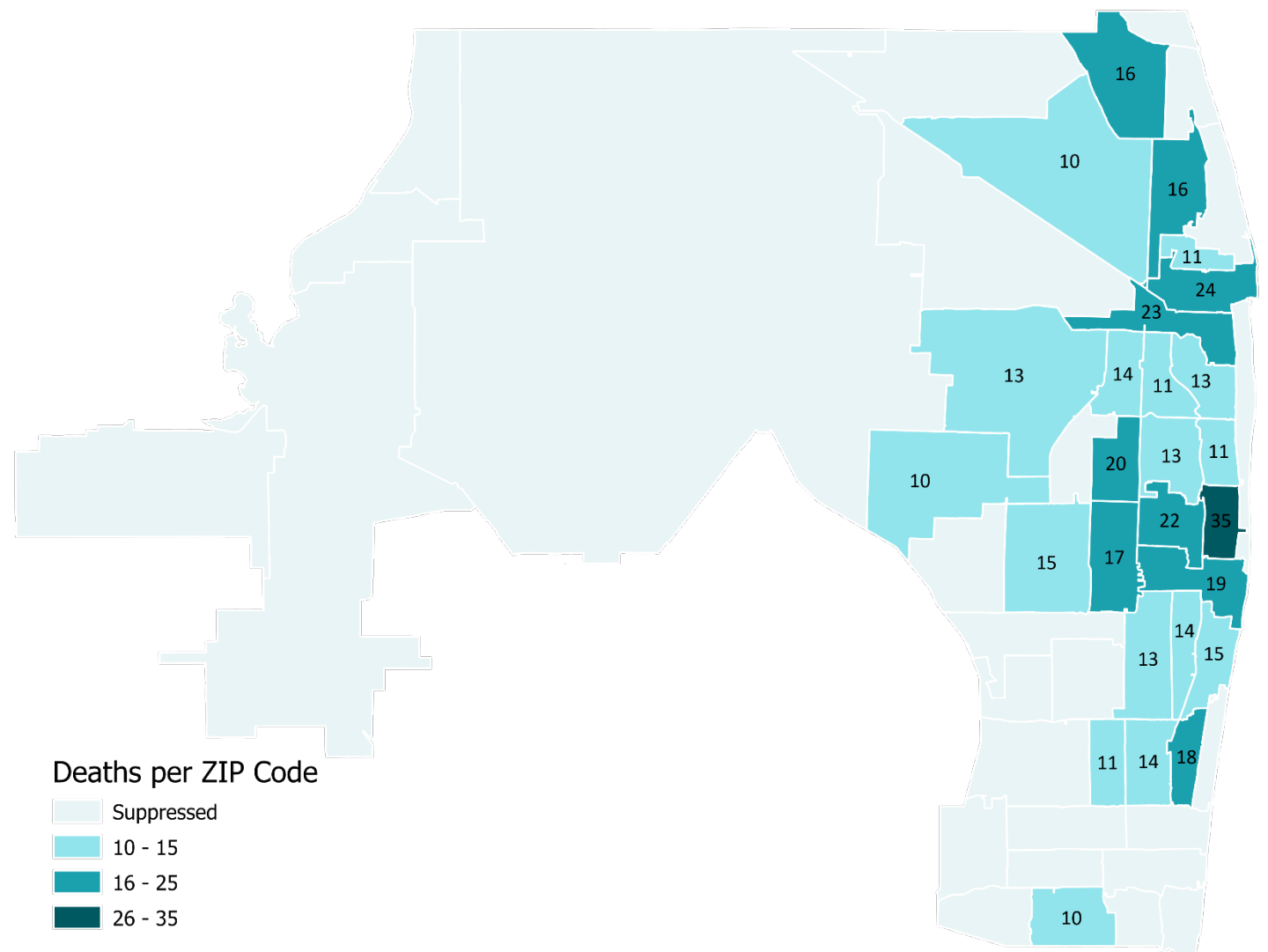
OVERDOSE DEATHS BY HOME ZIP CODE

Count of Overdose Deaths

Most of the people who died of overdose in 2021 were residents of Palm Beach County (n=484, 83.9%); the remaining 16.1% comprise individuals who live outside of PBC (e.g., tourists, residents of neighboring counties, and those in PBC for rehab) but experienced a fatal overdose in PBC. Data in the figure below shows the number of deaths in each ZIP Code by the decedent’s home address. Data for ZIP Codes where fewer than 10 deaths occurred was suppressed.

Lake Worth Beach ZIP Code 33460 had 35 overdoses, the highest number of overdoses by decedent’s home location. Decedents in this ZIP Code were more likely to be Hispanic (31.4% vs 13.2% overall), be residents of PBC (100.0% vs 83.9% overall) and have stable housing (77.1% vs 69.0% overall). Decedents in this ZIP code were less likely to have graduated high school, with 60.0% having a high school diploma or GED compared to 81.1% overall.

Map 2: Overdose Deaths by Decedent's Home Location

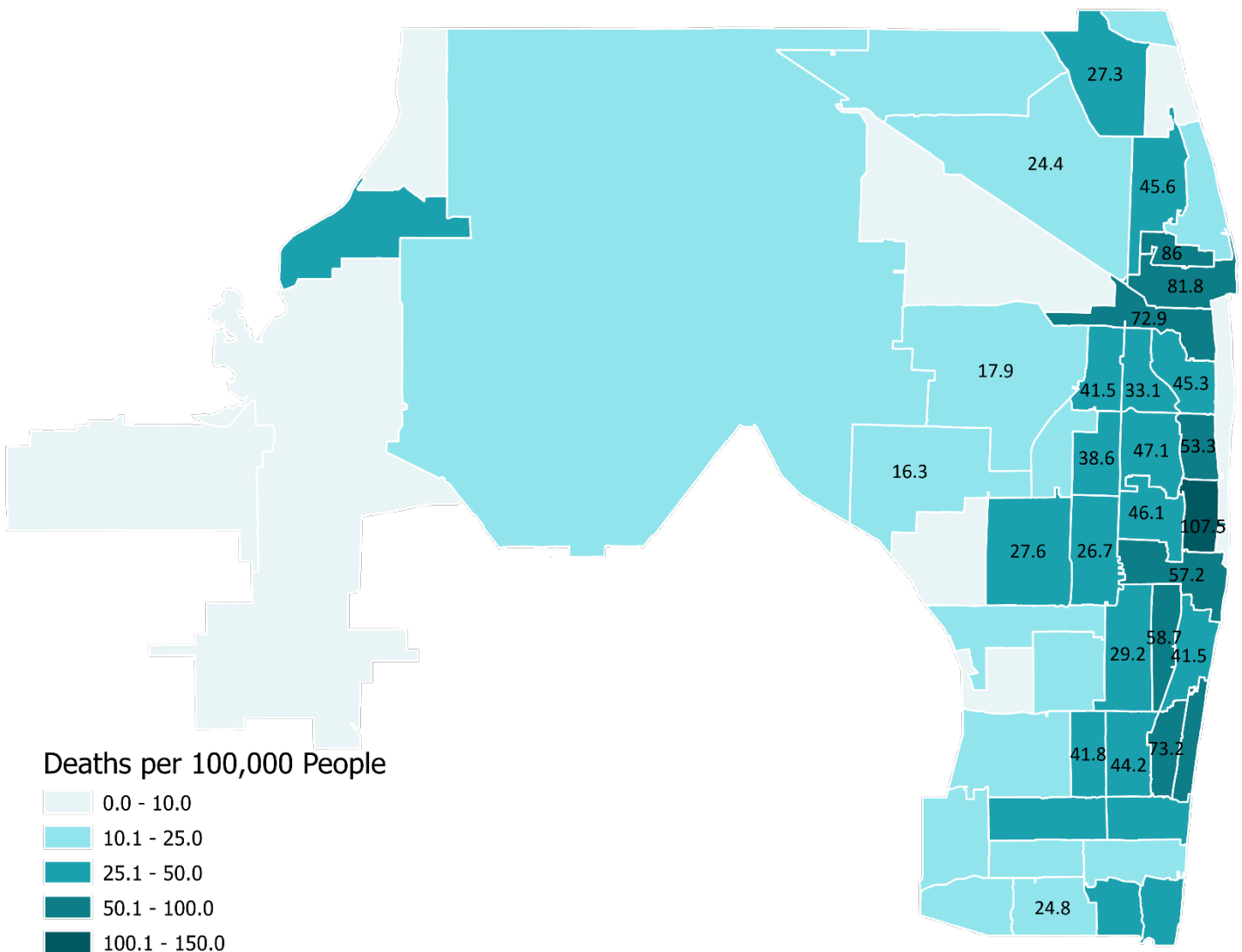


Rate of Overdose Deaths

The population in PBC is unequally distributed among ZIP Codes. Generally, the more densely populated areas are in the coastal regions of the county, and the county becomes less densely populated in its rural, far west regions. The figure below calculates the rate of overdose deaths per 100,000 people in each ZIP Code to adjust for some ZIP codes having larger populations than others.

Lake Worth Beach ZIP Code 33460 had the highest rates of overdose deaths based on the 2021 population estimates. When adjusted for population, however, the rates of overdose are much more dispersed throughout the county. The western region, Pahokee, has comparable rates to regions in West Palm Beach (25.1-50.0 overdose deaths per 100,000 people). Note that specific rates are not shown for ZIP Codes where the original count was less than 10 deaths per ZIP Code.

Map 3: Rate of Overdose Deaths Adjusted to Population by Decedent's Home Location

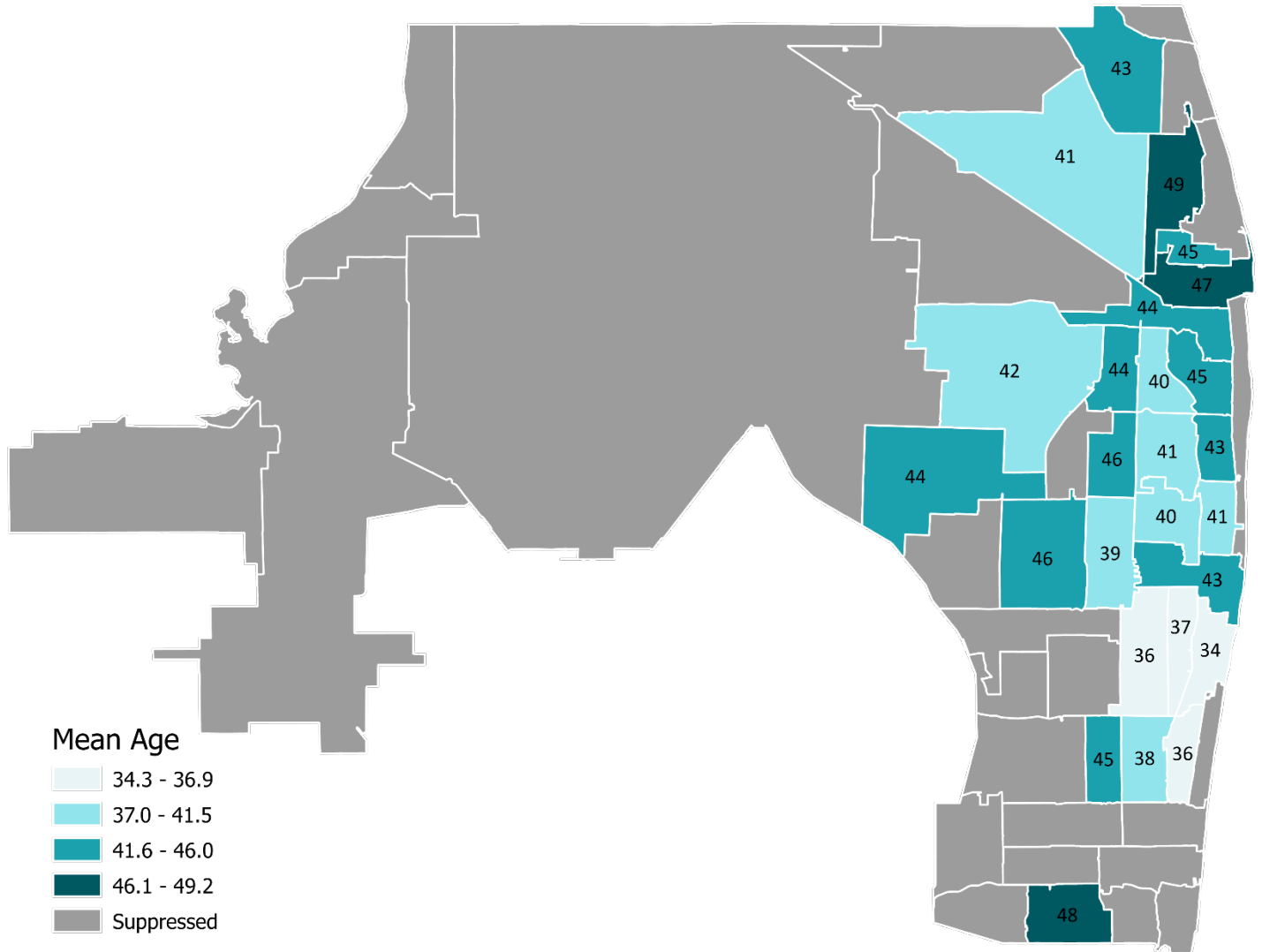


Note: ZIP Codes with less than 10 deaths were suppressed.

Average Age at Death

The map below shows the average age of decedents by home location. ZIP Code 33435 (Boynton Beach) had the lowest average age of decedent, 34 years. ZIP Code 33410 (Palm Beach Gardens) with the highest average age of decedent, 49 years.

Map 4: Average Age of Decedent by Home Location



OVERDOSE DEATHS BY INCIDENT LOCATION ZIP CODE

The previous two maps look at the regional burden of overdose deaths by where the decedent lived (i.e. their home address). That provides a limited view of the scope and magnitude of the problem for several reasons:



First, people often travel to obtain substances, either legal prescriptions or illicit substances. Depending on where the substance is used, a map of home ZIP Codes may or may not be a good representation for community partners to target prevention efforts and resources for SUD.



Second, PBC is a popular tourist destination. PBC welcomes all types of short-term and long-term visitors whose residence is in another county (6.6%), state (9.4%), or even another country (< 1.0%).

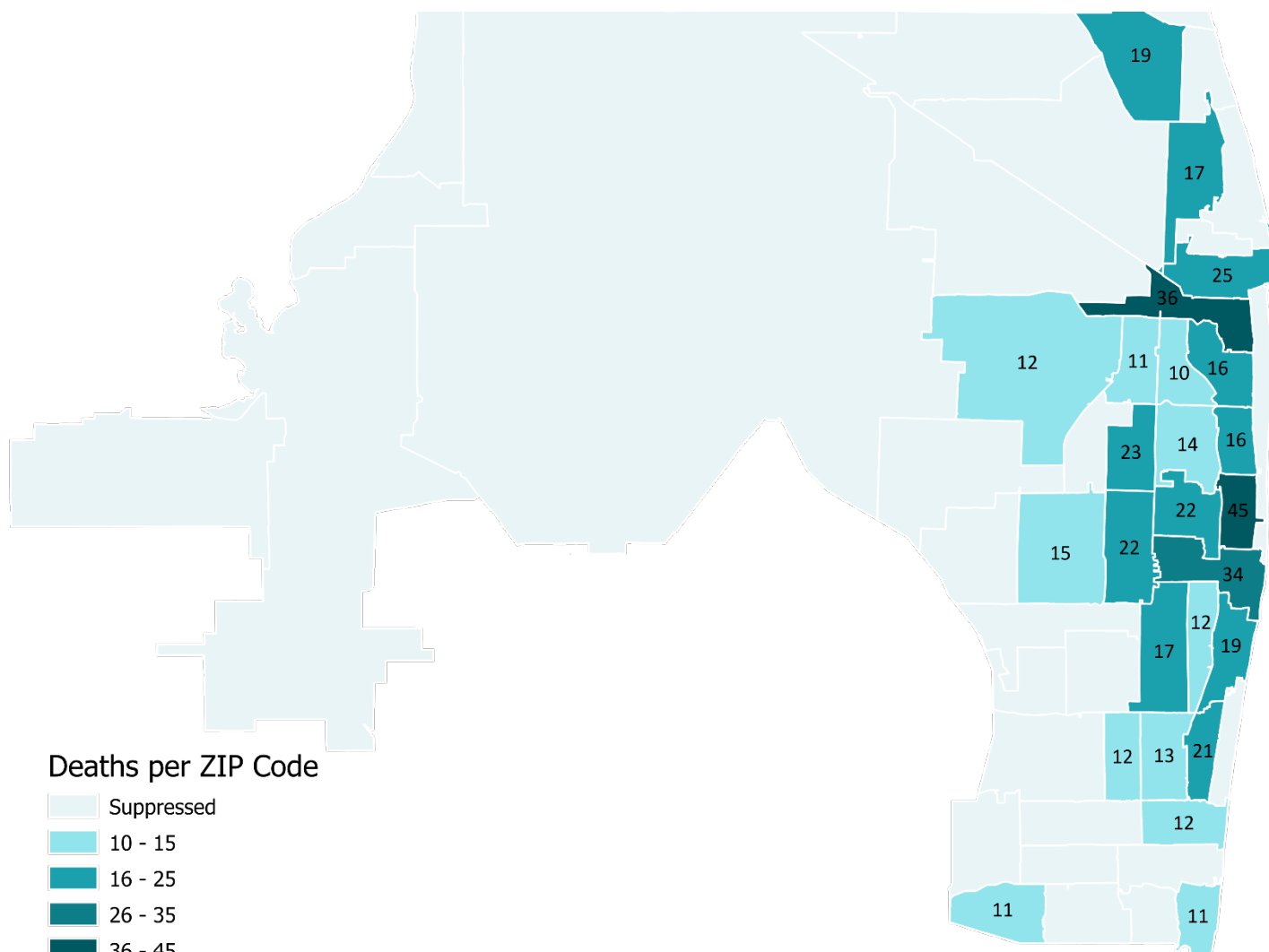


Finally, housing instability and insecurity persist across the U.S. In 2021, 7.8% of people who died of an overdose in PBC were homeless at the time of death. Another 18.9% had unstable housing, such as couch surfing, motel/hotel, or transitional housing like a SUD treatment facility or jail.

To account for some of these factors, the map below shows the distribution of deaths in PBC by the location (ZIP Code) of the overdose.

Count of Overdose Deaths

Map 5: Overdose Deaths by Incident Location

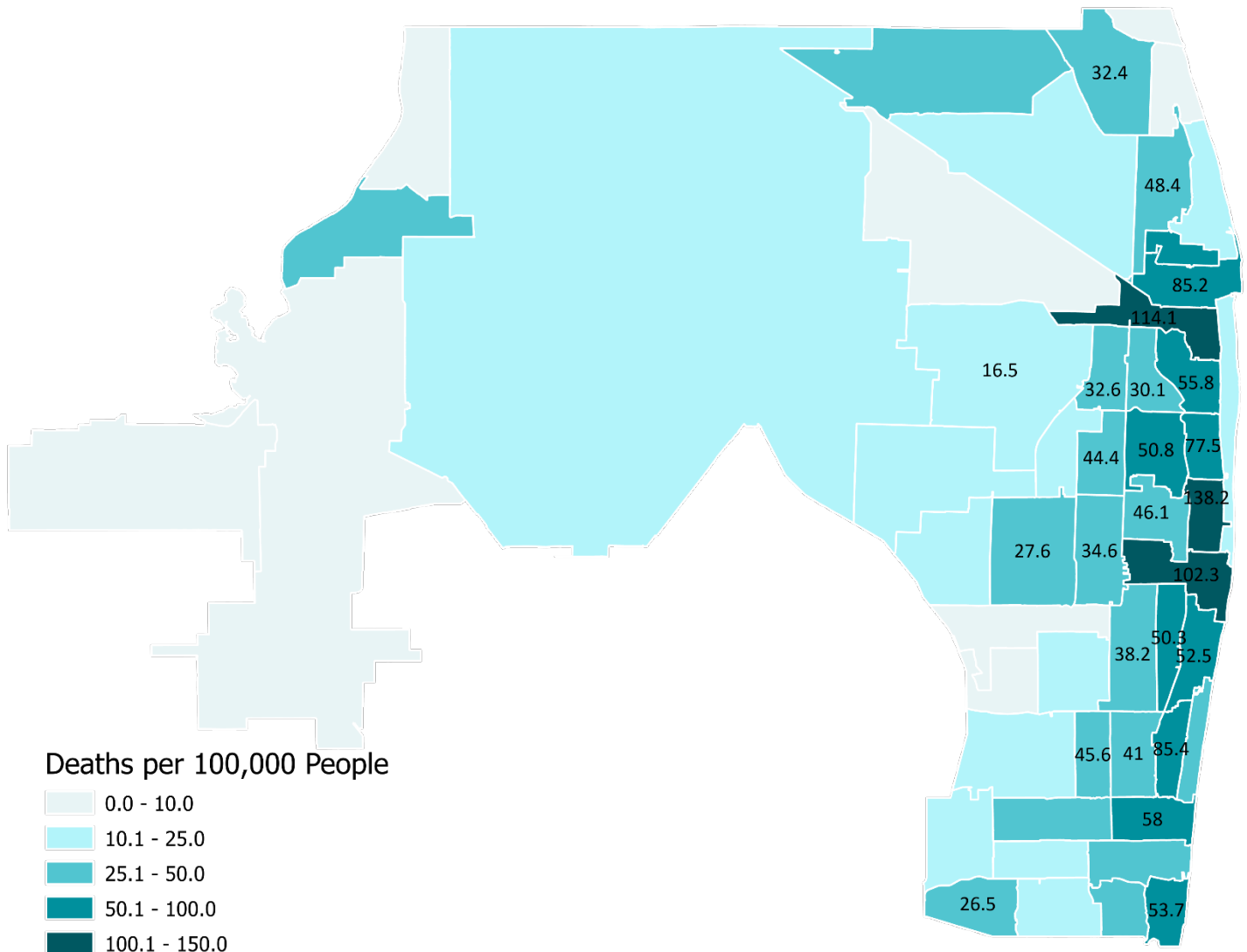


Note: ZIP Codes with less than 10 deaths were suppressed.

Rate of Overdose Deaths

Lake Worth Beach ZIP Codes 33460 and 33462 and West Palm Beach ZIP Code 33407 had the highest number of overdoses with respect to each population. ZIP code 33460 had the highest rate of deaths (138.2 deaths per 100,000 population) by location of overdose. Decedents who overdosed in 33460 were more likely to be homeless/unhoused (13.33% vs 7.8% overall). Decedents who overdosed in 33462 and 33407 were more likely to have a history of hepatitis C infection, 32.4% and 33.3% respectively, compared to 24.1% in the overall sample.

Map 6: Rate of Overdose Deaths Adjusted to Population by Incident Location

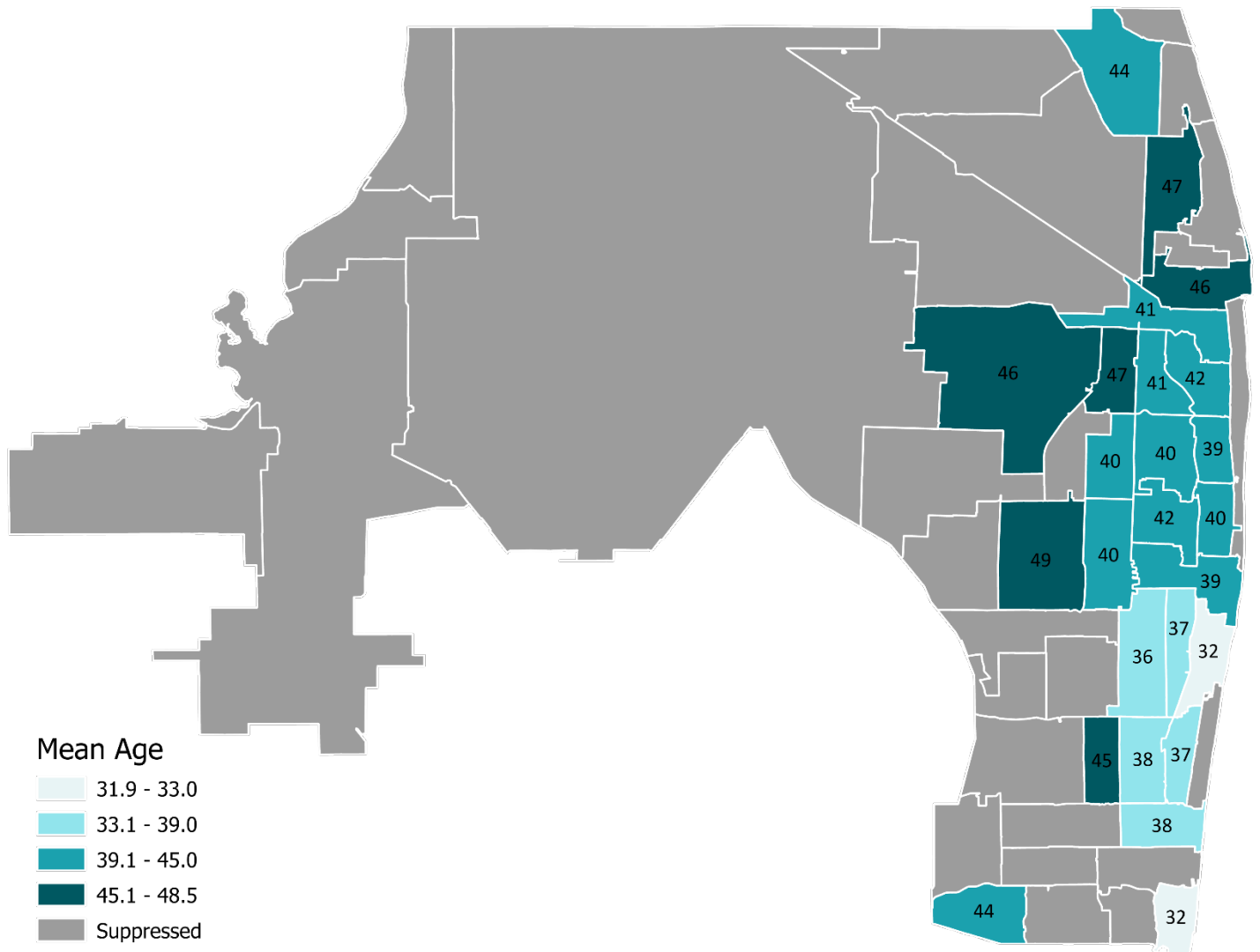


Note: ZIP Codes with less than 10 deaths were suppressed.

Average Age at Death

The map below shows the average age of decedents by incident location. Boca Raton ZIP Code 33432 and Boynton Beach ZIP Code 33435 had the lowest average age for overdose deaths. Nearly all of these decedents had at least a GED/high school diploma (99.7% vs 81.1% overall). The majority had at least some college experience (53.3% vs 35.2% overall).

Map 7: Average Age of Decedent by Incident Location

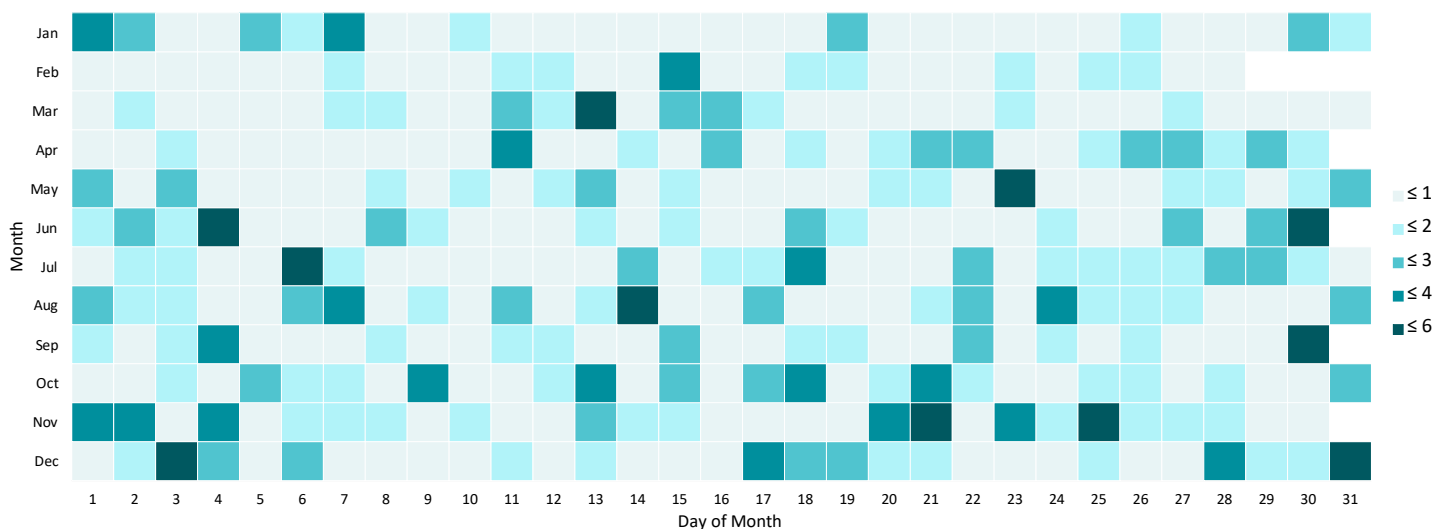


Note: ZIP Codes with less than 10 deaths were suppressed.

TEMPORAL TRENDS IN OVERDOSE DEATHS

The most overdose deaths in a single day occurred on June 30, 2021, with a total of 6 fatal overdoses. However, that same day also recorded one of the lowest number of ED visits for suspected overdose that year. On June 30, 2021, EDs only treated 19 suspected overdoses in Palm Beach County – 33.6% lower than the 2021 average of 28.6 suspected overdoses per day.

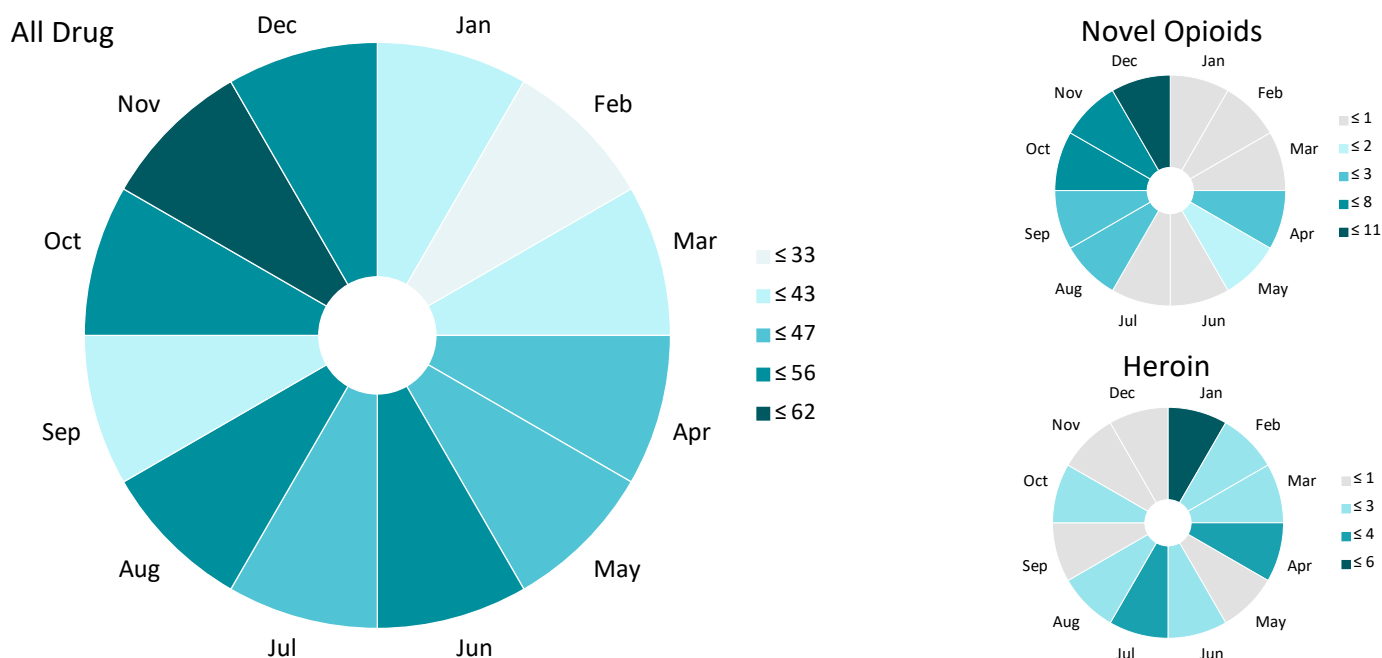
Figure 3: Number of Overdose Deaths by Month and Day of the Month



Overdose Trends by Month

One-third of all overdose deaths in 2021 were between October and December. November had the most deaths (n=62, 10.8%), and February had the fewest (n=33, 5.7%). Disparities in temporal trends existed for several substances, such as novel opioids and heroin. Powerful new opioids like the nitazenes group and fluorofentanyl did not emerge until the end of the year. Deaths from heroin peaked in January and declined over the rest of the year.

Figure 4: Overdose Deaths by Month for All Drug, Novel Opioids, and Heroin

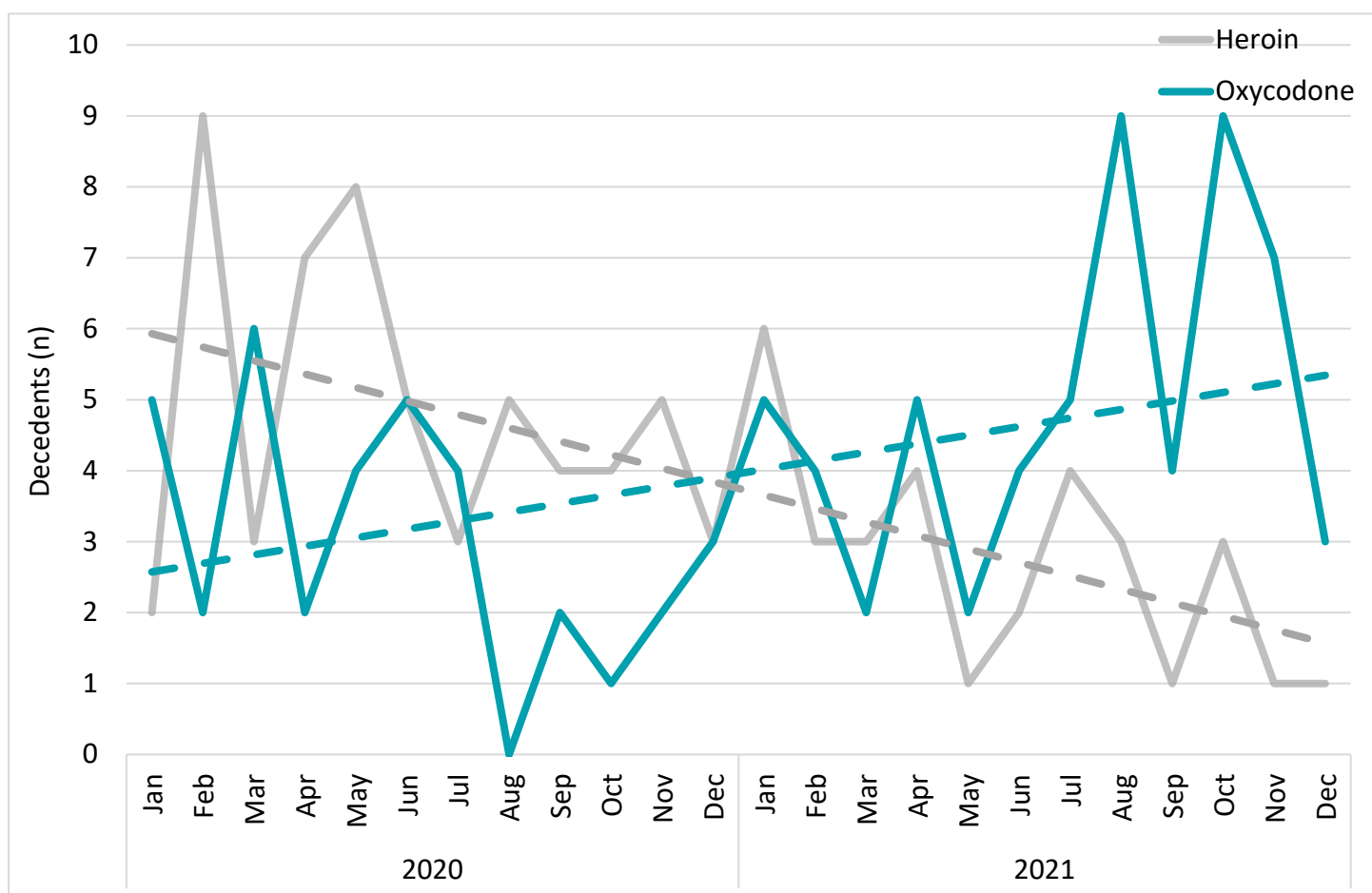


The Decline of Heroin

The 2010 rise in overdose deaths in the U.S. was largely attributed to heroin. At the time, heroin was a powerful and inexpensive illicit opioid that served as an alternative to prescription opioids when restrictions on prescribing practices were set in place. Interestingly, data from recent years shows that overdose deaths from heroin have been decreasing significantly, while deaths from prescription opioids like oxycodone have increased.

In 2021, oxycodone deaths surpassed the number of heroin deaths. Furthermore, not a single overdose death in Palm Beach County was attributed to heroin alone. All heroin-involved overdose deaths involved multiple substances. The average number of substances listed as a COD for heroin-involved overdose deaths was 1.5 times that of the sample overall (average of 3.2 substances vs. 2.2 substances). Fentanyl was the most co-reported COD for heroin-involved deaths, with 96.9% of heroin deaths also involving fentanyl. Other substances frequently reported with heroin-involved deaths were acetylfentanyl (25.0%), cocaine (21.9%), and alcohol (12.5%).

Figure 5: Heroin and Oxycodone Trends, 2020-2021



The Rise of Novel Psychoactive Substances

Although fentanyl continues to dominate the news headlines with record-breaking overdose deaths, overdose surveillance programs across the country are monitoring for novel psychoactive substances (NPS) in the illicit drug market. The term NPS is commonly applied to new or newly emerging substances of abuse and can apply to opioids, stimulants, or other types of substances. NPS involved in overdose deaths in this report includes:

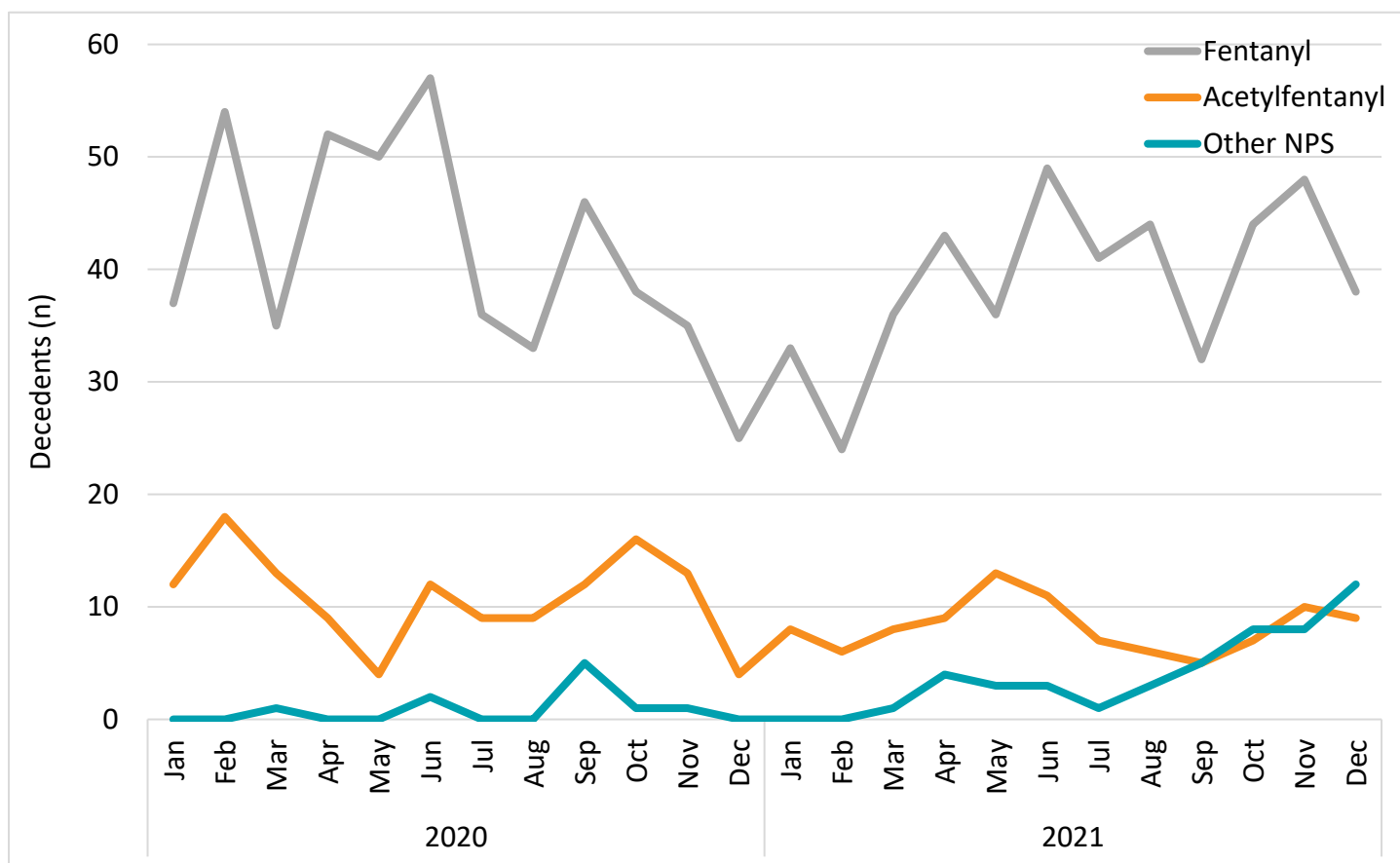
Opioids: acetylfentanyl, metonitazene, N-pyrrolidino etonitazene, fluorofentanyl, acrylfentanyl, butyrfentanyl, and methoxyacetylfentanyl

Synthetic Cathinones: eutylone, pentylone

Benzodiazepines: etizolam

In 2021, NPS were involved in 139 overdose deaths (24.1%). The figure below compares trends for fentanyl, acetylfentanyl, and other NPS over the past two years in PBC. While acetylfentanyl accounts for the largest share of deaths involving an NPS (n = 99, 17.2%), other novel substances have emerged in the last half of 2021 that appear to be on track to outpace acetylfentanyl in 2022. The main drivers of this increase are a class of substances called nitazenes (primarily metonitazene and N-pyrrolidino etonitazene) and fluorofentanyl.

Figure 6: Fentanyl and NPS Opioid Trends, 2020-2021



DEMOGRAPHICS

Deaths from overdose have been increasing across the U.S. in recent years. This epidemic affects people in every area of this country, in every type of community, and from every walk of life. Indeed, it is likely that you, the reader, are personally affected – or know someone affected – by this epidemic. This report centers people in our understanding of the epidemic by using person-first language and medically accurate terms as often as possible to reduce stigma toward people with SUD.

The 2021 fatal overdose surveillance sample reviewed 577 cases. The sample was largely White/non-Hispanic (76.4%, n=441) and male (72.3%, n=417). Ages ranged from 1-91 years, with a median value of 38 and a mean age of 40.8 years. The sample was 9.5% (n=55) Black/non-Hispanic, 13.2% (n=76) Hispanic, and 0.8% (n=5) Other/NH.

Race and ethnicity in this report are categorized into four groups: White/non-Hispanic (NH), Black/NH, Other/NH, and Hispanic. OD2A PBC recognizes the multitude of racial and ethnic groups that make up South Florida. Due to lack of consistency in racial and ethnic reporting across EMS, hospitals, and other data sources, a practical decision was made to group race and ethnicity into broad categories. The “other” race/ethnicity category includes American Indian, Alaskan Native, Native Hawaiian, Pacific Islander, and Asian. Other/NH accounted for 0.8% (n=5) of overdoses. The small sample size introduces possible bias and may not represent the larger population of those categorized in Other/NH. To prevent misrepresentation, some figures in this report may omit the category from analysis. All figures in which this occurred are noted in the footnotes for that figure.

Figure 7: Overdoses by Sex

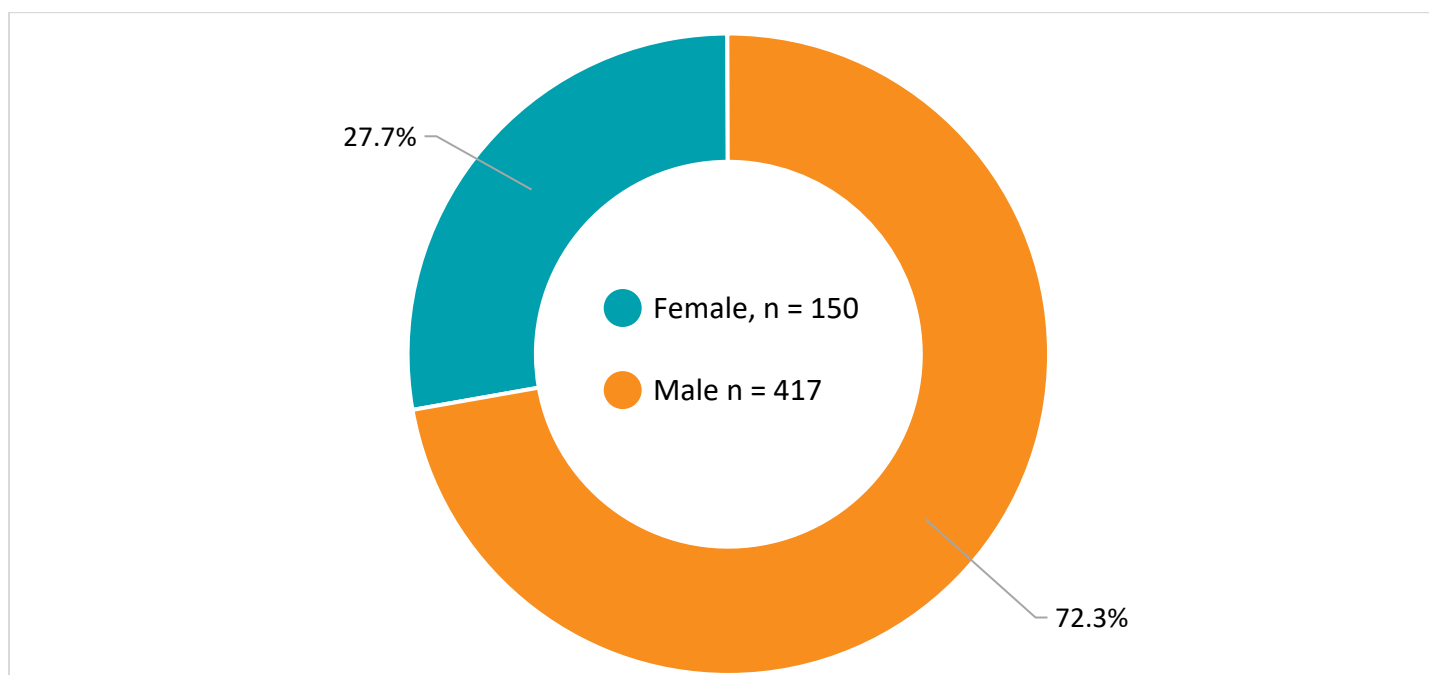


Figure 8: Race/Ethnicity by Sex

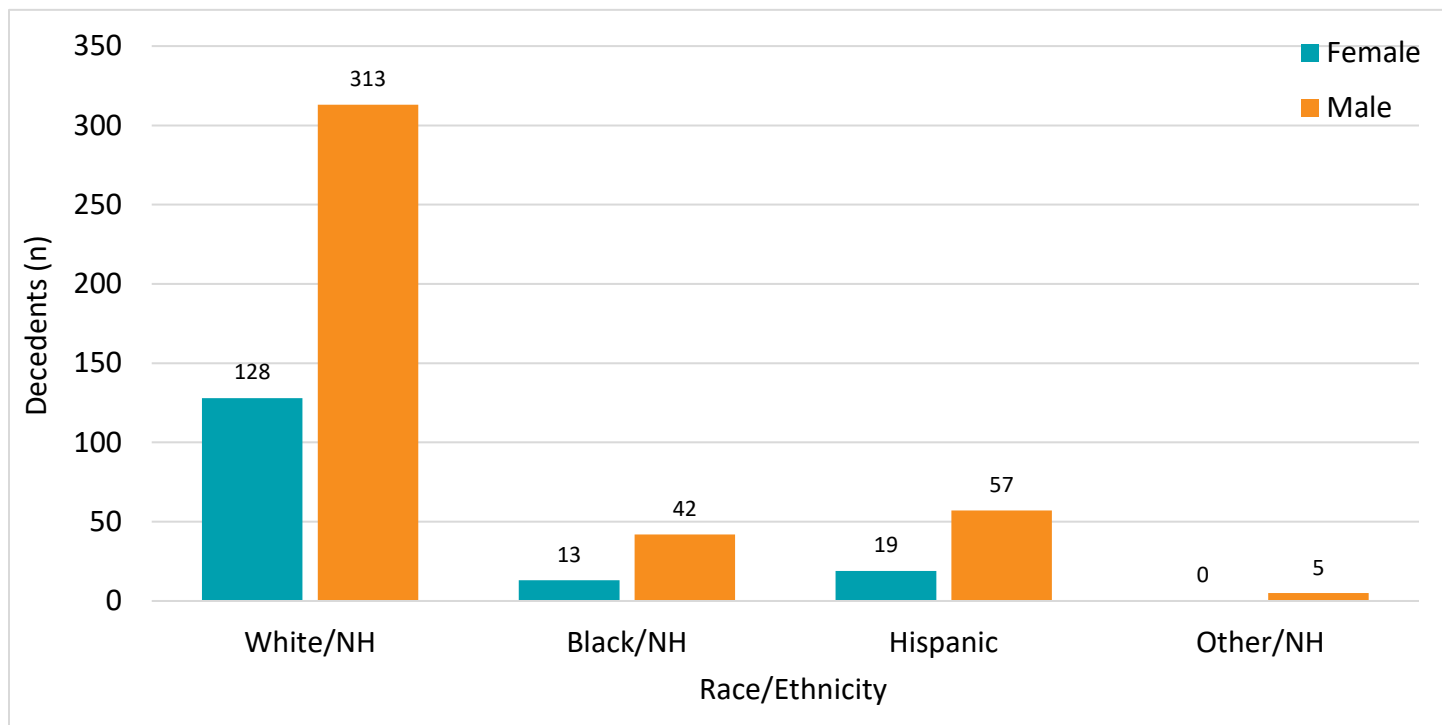
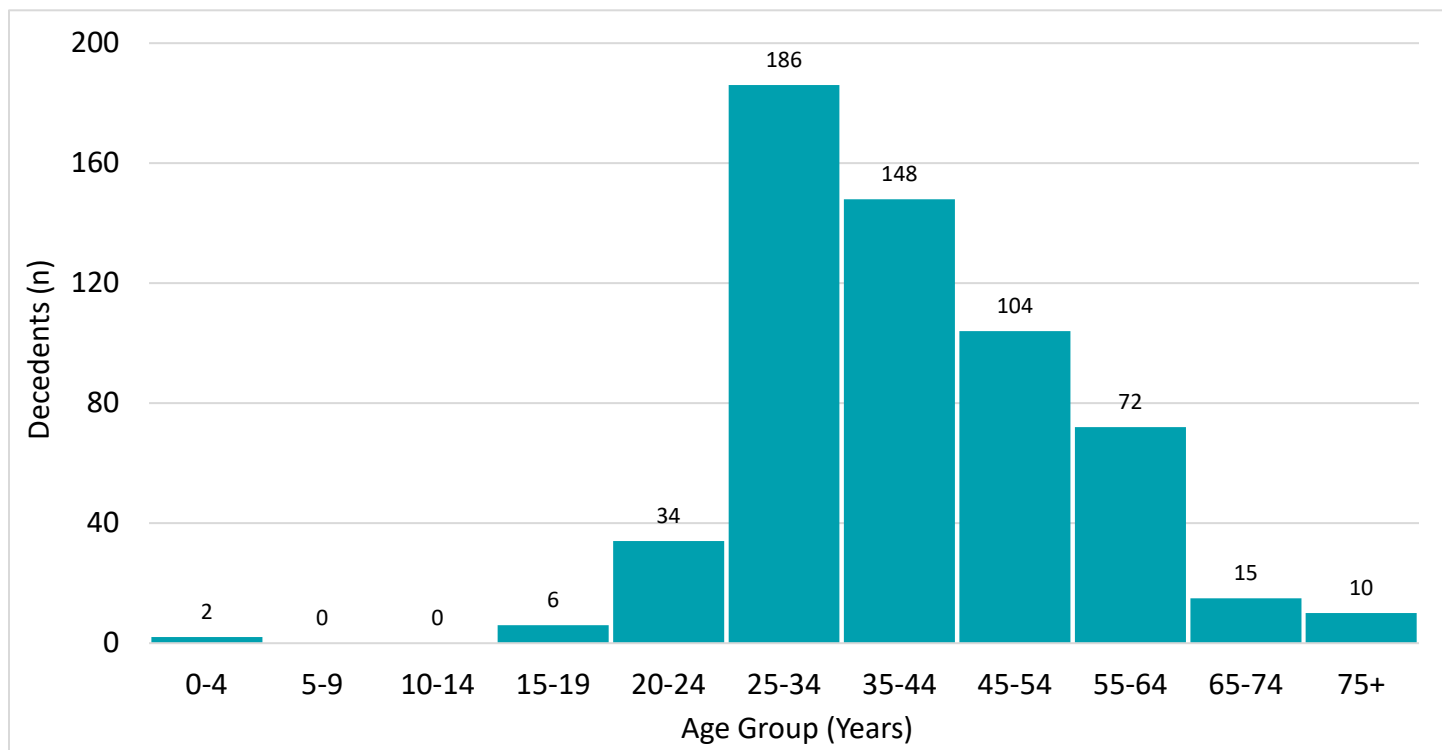


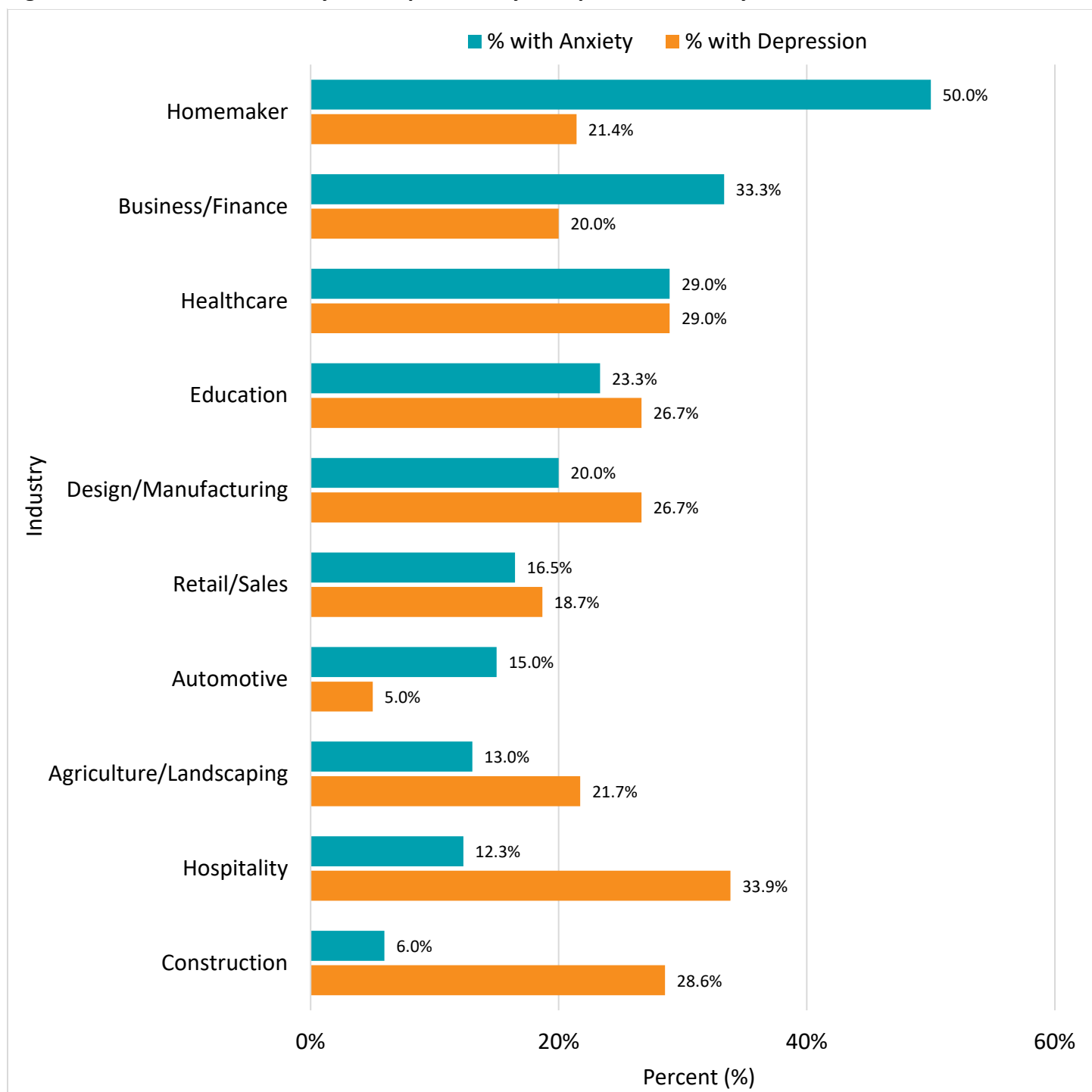
Figure 9: Age Distribution by Age Group (Years)



OCCUPATION AND MENTAL HEALTH

The most common occupational industry for decedents in 2021 was retail/sales (n = 91, 15.8%). The overall prevalence of anxiety and depression was 16.5% (n = 95) and 28.6% (n = 165) respectively. The figure below shows the 10 most common occupational industries and the percentage of decedents in those industries with anxiety and with depression. Industries listed below are gathered from death certificates, which reports the occupation/industry held for most of the decedent's life. This figure does not reflect the employment status at time of death, or the last occupation held by decedents.

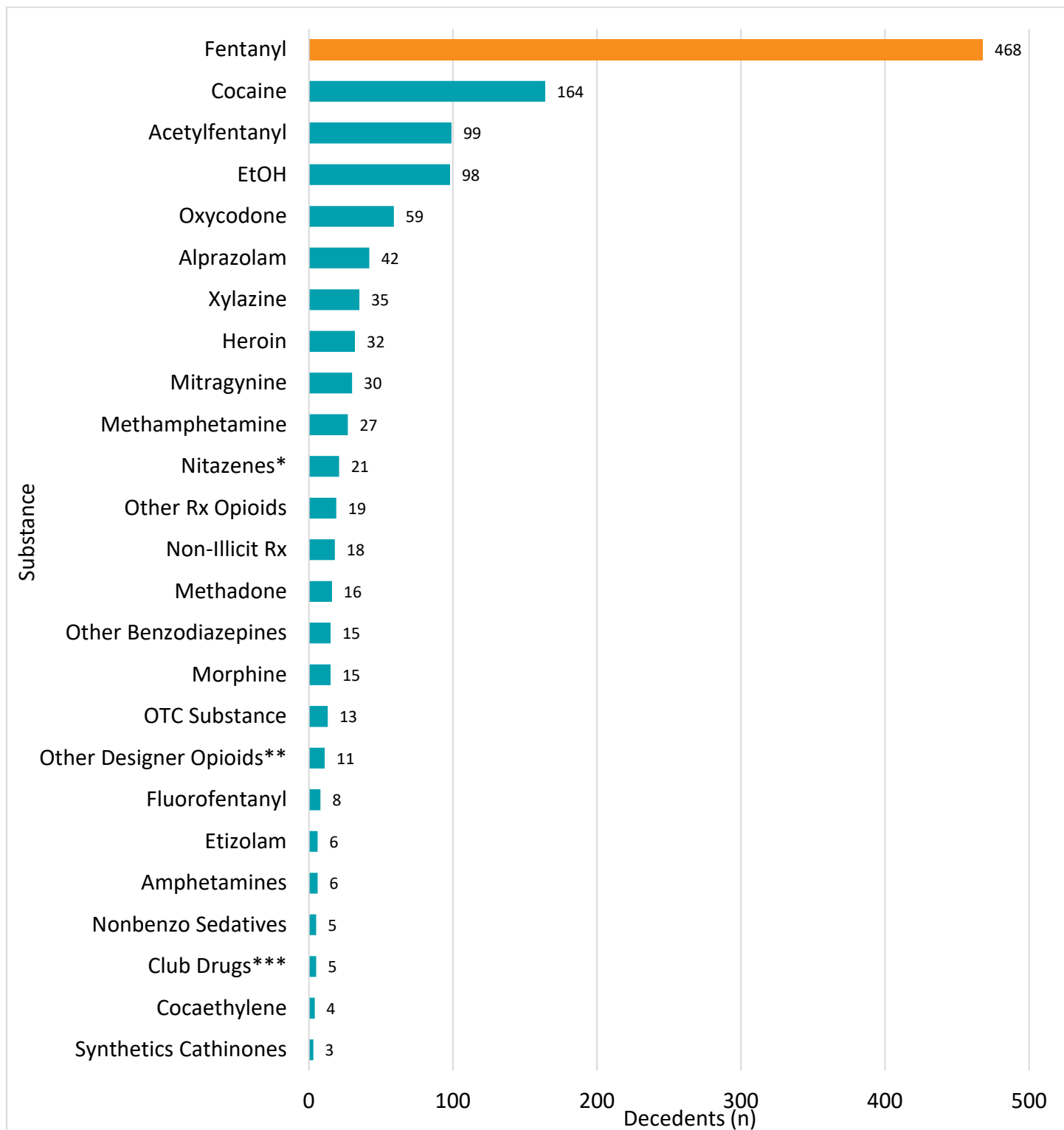
Figure 10: Prevalence of Anxiety and Depression by Occupational Industry



OVERDOSE DEATHS BY SUBSTANCE

The figure below shows the substances listed as a cause of death. Substances are not mutually exclusive and do not account for deaths involving more than one substance (polysubstance). Fentanyl was listed as a cause of death in the majority of overdoses (n = 468, 81.1%), followed by cocaine (n = 164, 28.4%).

Figure 11: Substances Listed as Cause of Death



* Nitazenes include N-pyrrolidino etonitazene and metonitazene.

** Other designer opioids include acrylfentanyl, butyrfentanyl, and methoxyacetylfentanyl.

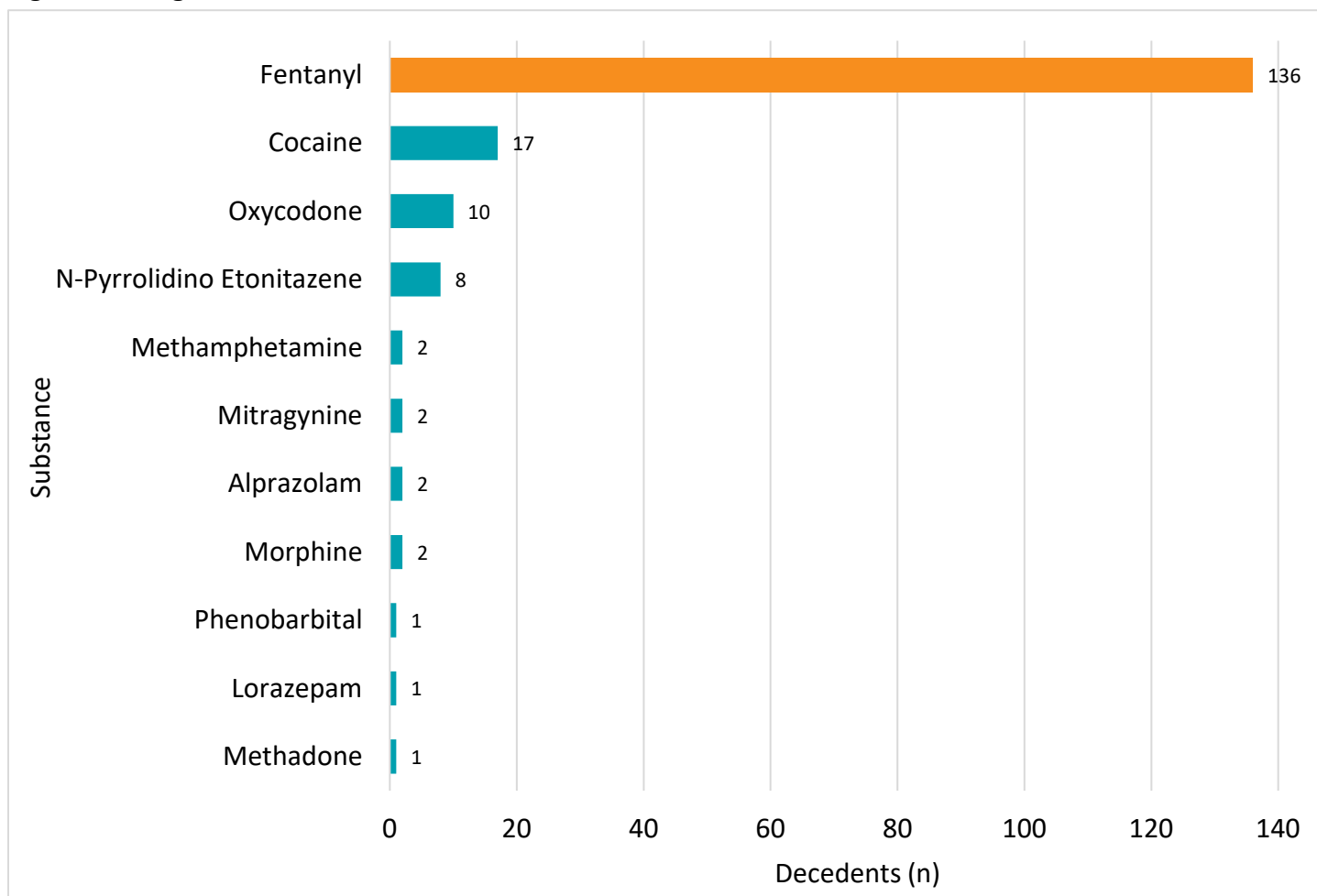
*** Club drugs include GHB, ketamine, and MDMA.

Single Substance Cause of Death

In 2021, 182 (31.5%) overdose deaths were attributed to a single substance on the death certificate. This is a 19.7% increase from 2020 (n = 152). The decedent may have had other substances present in their system that were not determined to be a cause of death. Substance detection can vary by substance, and decedents may test positive for substances not used for days or weeks prior to overdose.

The figure below shows the substances listed as a cause of death for decedents in which a single substance was listed as the cause of death. Fentanyl was the leading cause of death in 74.7% (n = 136) of single substance overdose deaths.

Figure 12: Single Substance Cause of Death



What is Mitragynine? Kratom, Mitragynine, and Misconceptions



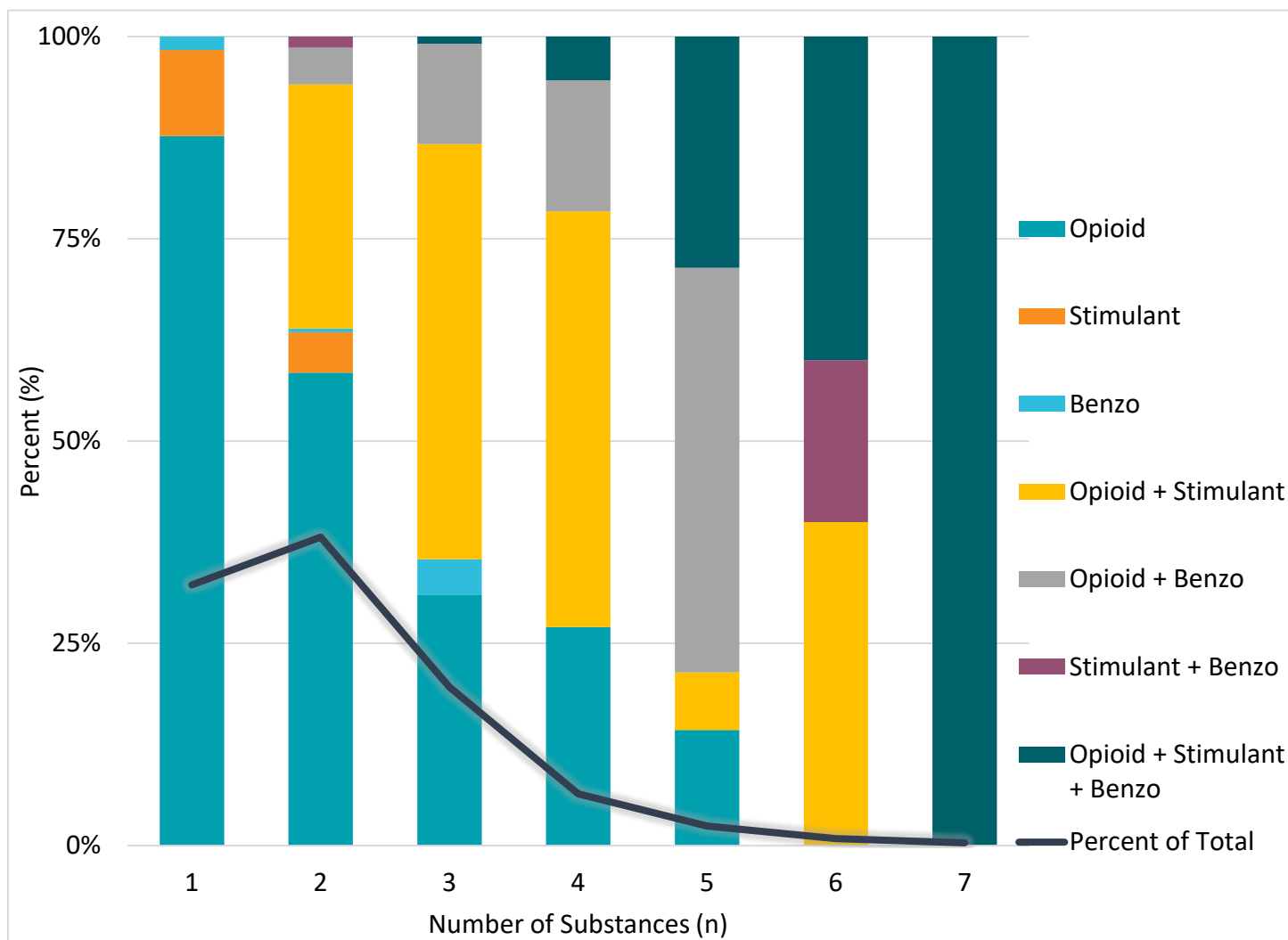
Kratom, a medicinal plant from southeast Asia, has been gaining popularity in the U.S. as a natural opioid agonist supplement commonly sold in powder or capsule form. It is commonly marketed as a safe herbal substance. Mitragynine, the psychoactive compound found in kratom, binds to the mu-opioid receptor, the same receptors to which opioids like fentanyl or heroin bind⁸. While the research is limited, there is some evidence that kratom use carries the risk of respiratory depression similar to that seen in opioids⁹. In PBC, mitragynine-involved deaths increased 66.7%, from 18 mitragynine-involved deaths in 2020 to 30 mitragynine-involved deaths in 2021. Two deaths in 2021 listed kratom as the *only* substance as the immediate cause of death. The regulation of kratom in the U.S. varies by state. In Florida, kratom is banned in Sarasota County but remains legal elsewhere.

Polysubstance cause of Death

In 2021, 391 (67.8%) overdose deaths listed more than one substance as the COD. The number of substances in polysubstance deaths ranged from 2 to 7, with an average of 2.7 substances. The majority of polysubstance deaths included fentanyl (n = 332, 84.9%), with other substances following a similar trend to what is seen in .

The figure below shows how the composition of substances changes in relation to the number of substances listed as a COD. When a single substance is the COD, an opioid (e.g., fentanyl) is by far the most prevalent substance. But as the number of substances involved increases, there is a greater variety in the type of substance involved. It is important to note that the number of overdoses is greatest at 2 substances (n = 220, 38.1%). The *number* of deaths decreases significantly as the number of substances increases to 7. Due to the small sample sizes of deaths in the upper values (4-7 substances), use caution when interpreting.

Figure 13: Overdose Deaths by Substance Type and Number of Substances



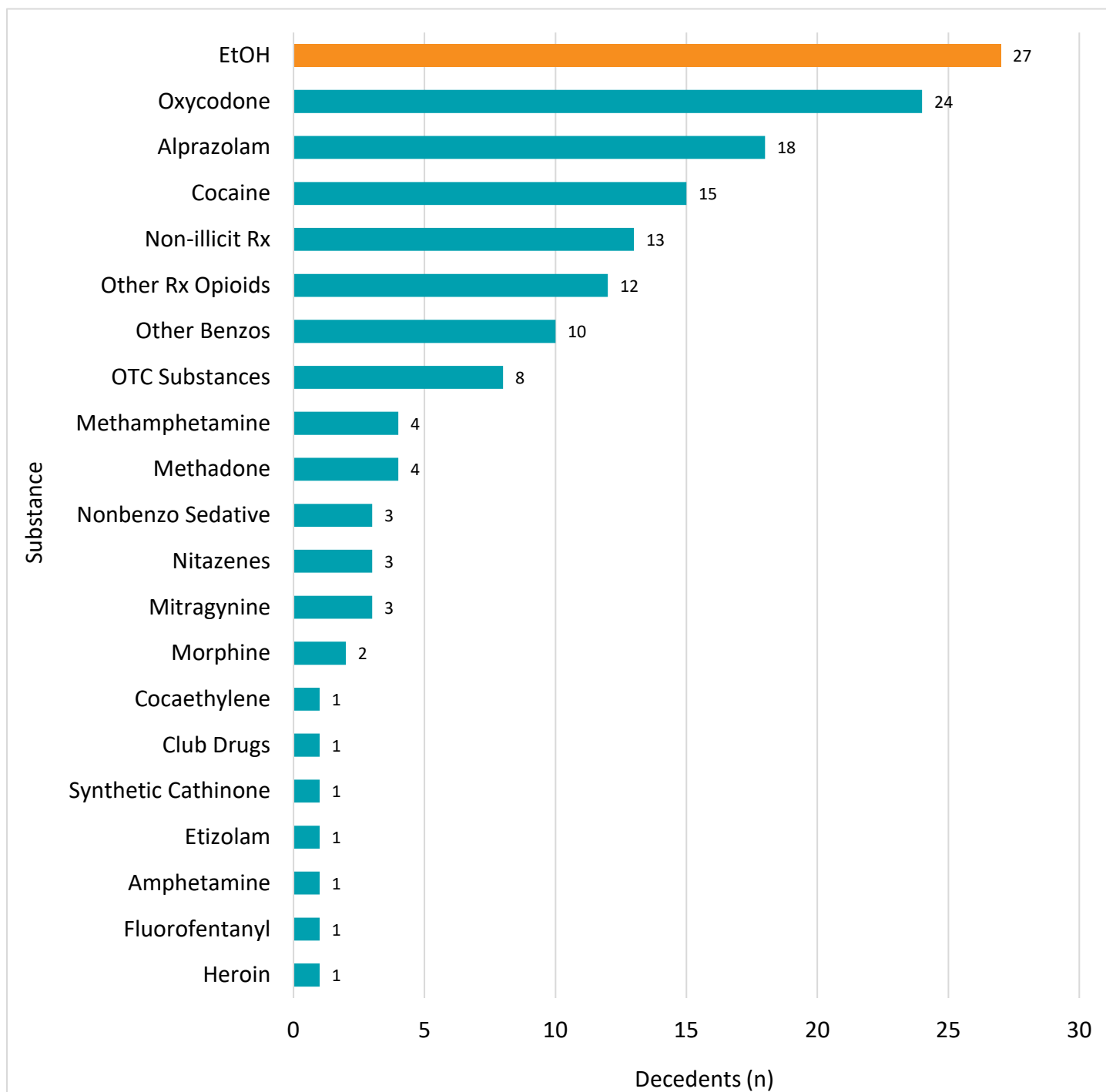
Note: Where number of substances is two or more, “opioid” may refer to more than one type of opioid (e.g., fentanyl and oxycodone), “stimulant” may refer to more than one type of stimulant, and “benzo” may refer to more than one type of benzodiazepine.

Polysubstance Deaths Excluding Fentanyl

The figure below details the substances involved in polysubstance overdose deaths in which fentanyl was *not* listed as a COD (10.2%, n = 59). Decedents in this subgroup were significantly older than the overall sample, with a median age of 47 years (IQR = 37-57 years) compared to the sample median age of 38 years (IQR = 31-47.5).

Compared to all overdoses involving fentanyl, those that did *not* involve fentanyl were nearly 25 times as likely to have been suicides. Viewed another way, people who overdosed to take their own lives were only 4% as likely to have used fentanyl as a contributing substance.

Figure 14: Polysubstance Overdoses in Which Fentanyl Was Not a Cause of Death



* Nitazenes include N-pyrrolidino etonitazene and metonitazene.

** Club drugs include GHB, ketamine, and MDMA.

SUBSTANCE USE HISTORY

Substance use history strongly correlates with the risk of subsequent fatal overdose. In 2021, 95.0% (n = 548) of decedents had a known history of substance use. Estimated age of first use was collected for 136 decedents as reported by next-of-kin. The median age of first known use was 19 years (IQR = 16-26 years). Decedents who started using substances between 15-19 years of age had the lowest median age of death, 30 years (IQR = 26 – 37). The median duration of substance use was 15 years (IQR = 9-20 years), estimated by the difference between age of first use and age at death (in cases for which data was available).

Figure 15: Age of First Known Substance Use (Years)

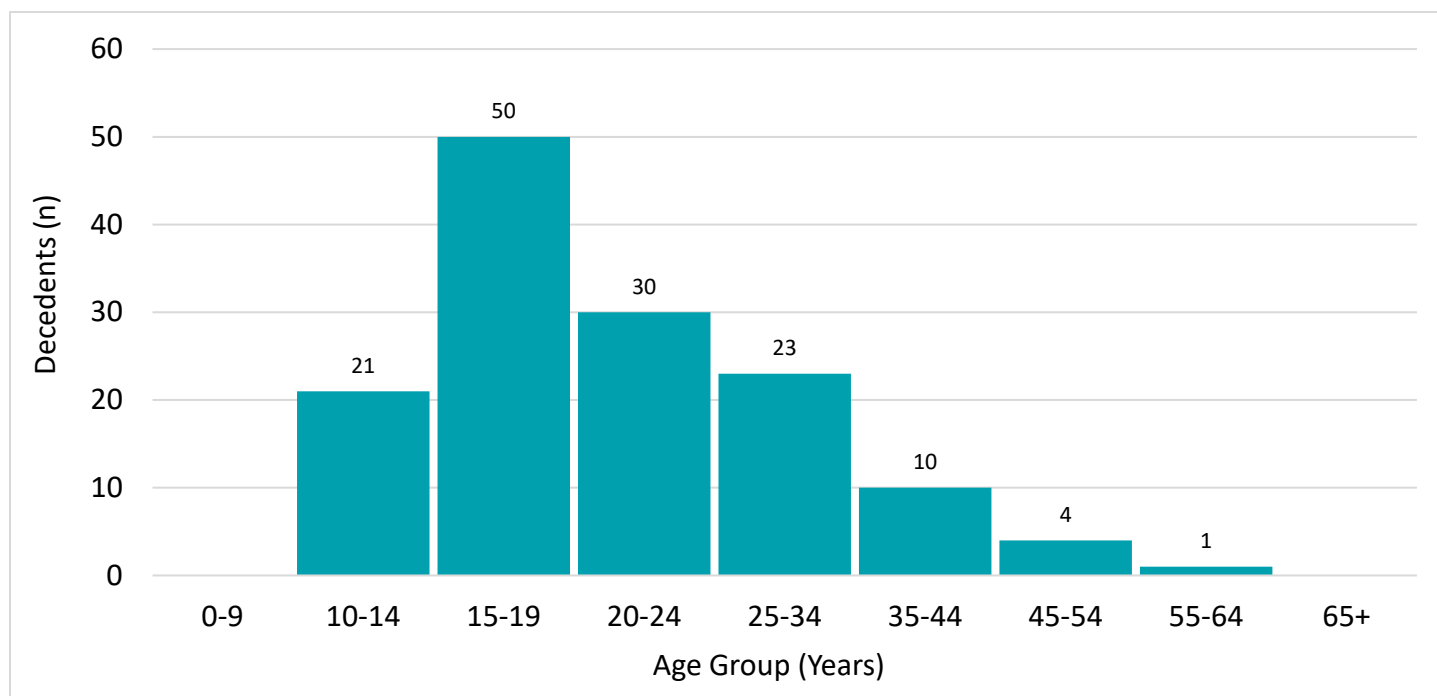
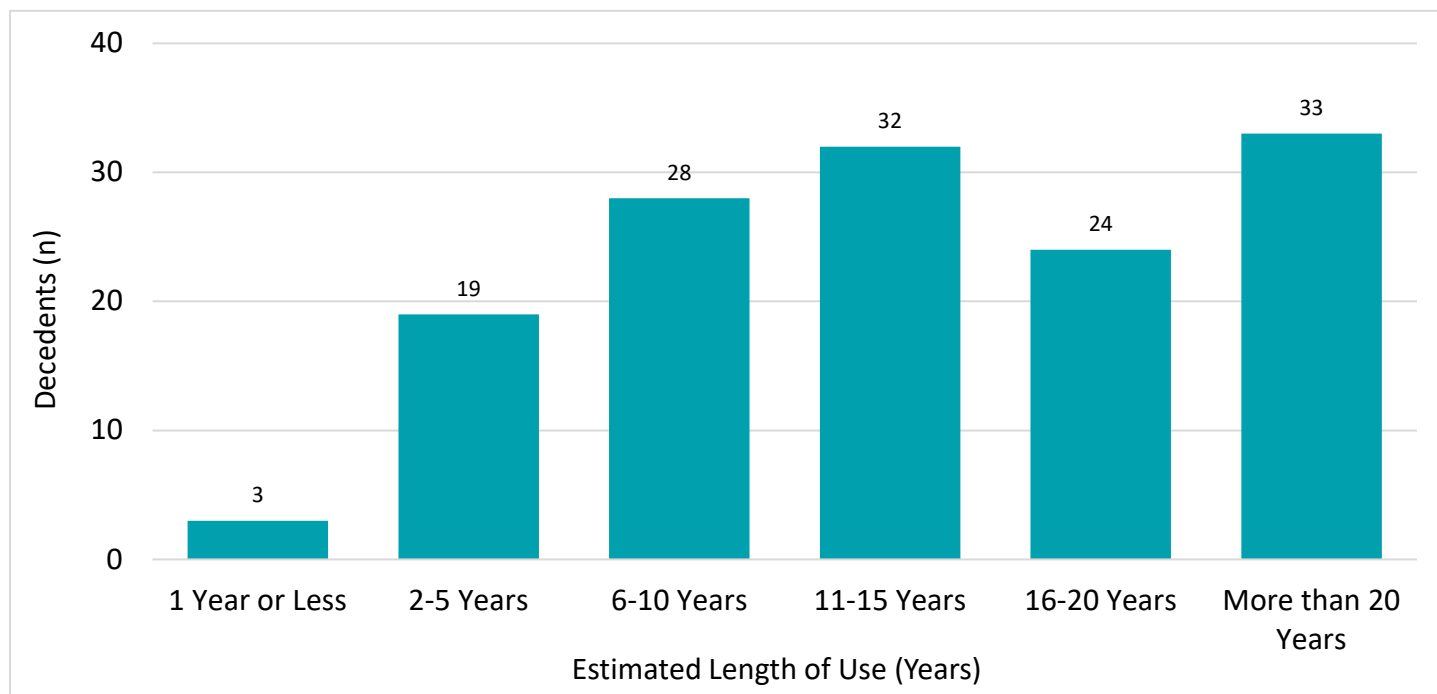


Figure 16: Estimated Length of Substance Use (Years)

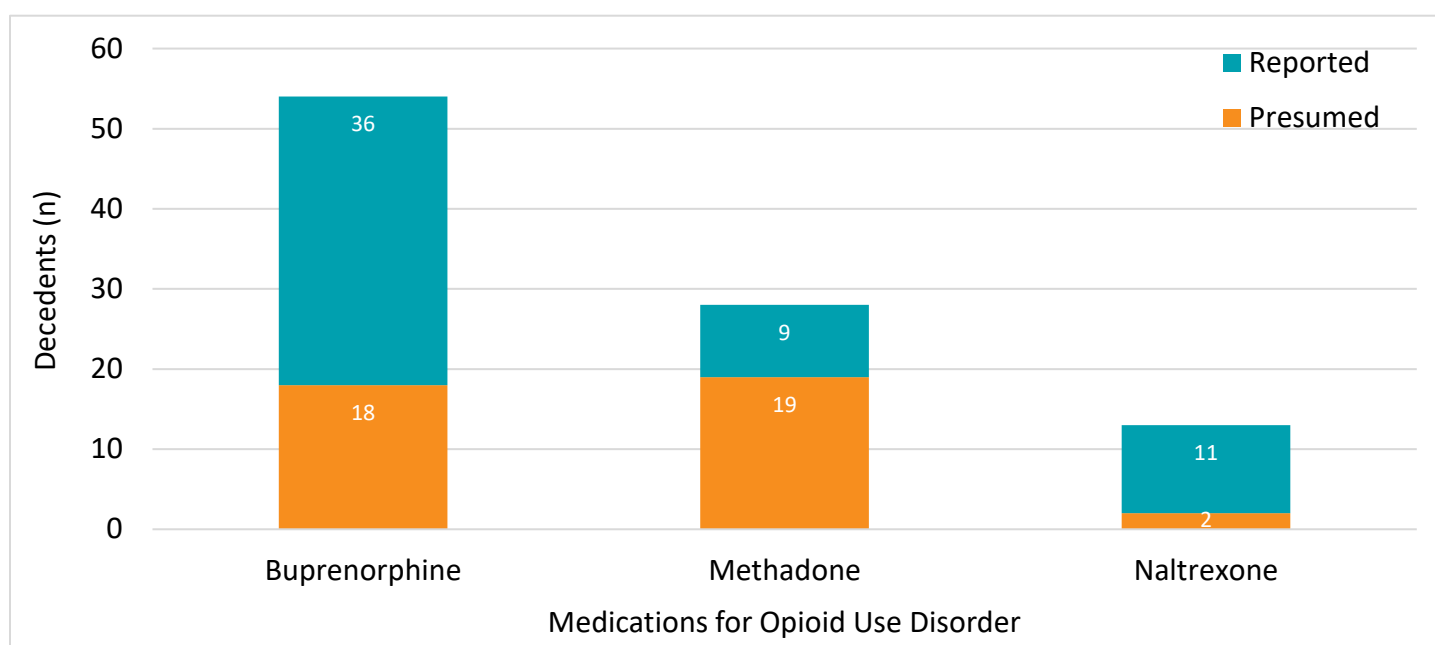


HISTORY OF TREATMENT

Around half of decedents had a known history of treatment for SUD (n=268, 46.5%). History of treatment is a broad variable that includes any indication that a person has spent time in recovery. Recovery itself is defined as an attempt to overcome SUD regardless of the method to achieving a state of recovery. Since there is no one path towards recovery, history of treatment includes but is not limited to: detox facilities, SUD treatment facilities, sober living facilities, 12-step programs, periods of abstinence, medications for opioid use disorder MOUD, psychiatric-based therapies, or any other situation that the person or next-of-kin defined as recovery.

The figure below shows the number of decedents who had a reported or presumed use of MOUD. Reported data was obtained from investigator reports or past medical records for the decedent that list MOUD treatment. Presumed MOUD was determined by a positive toxicology for buprenorphine, methadone, naltrexone, or their respective metabolites.

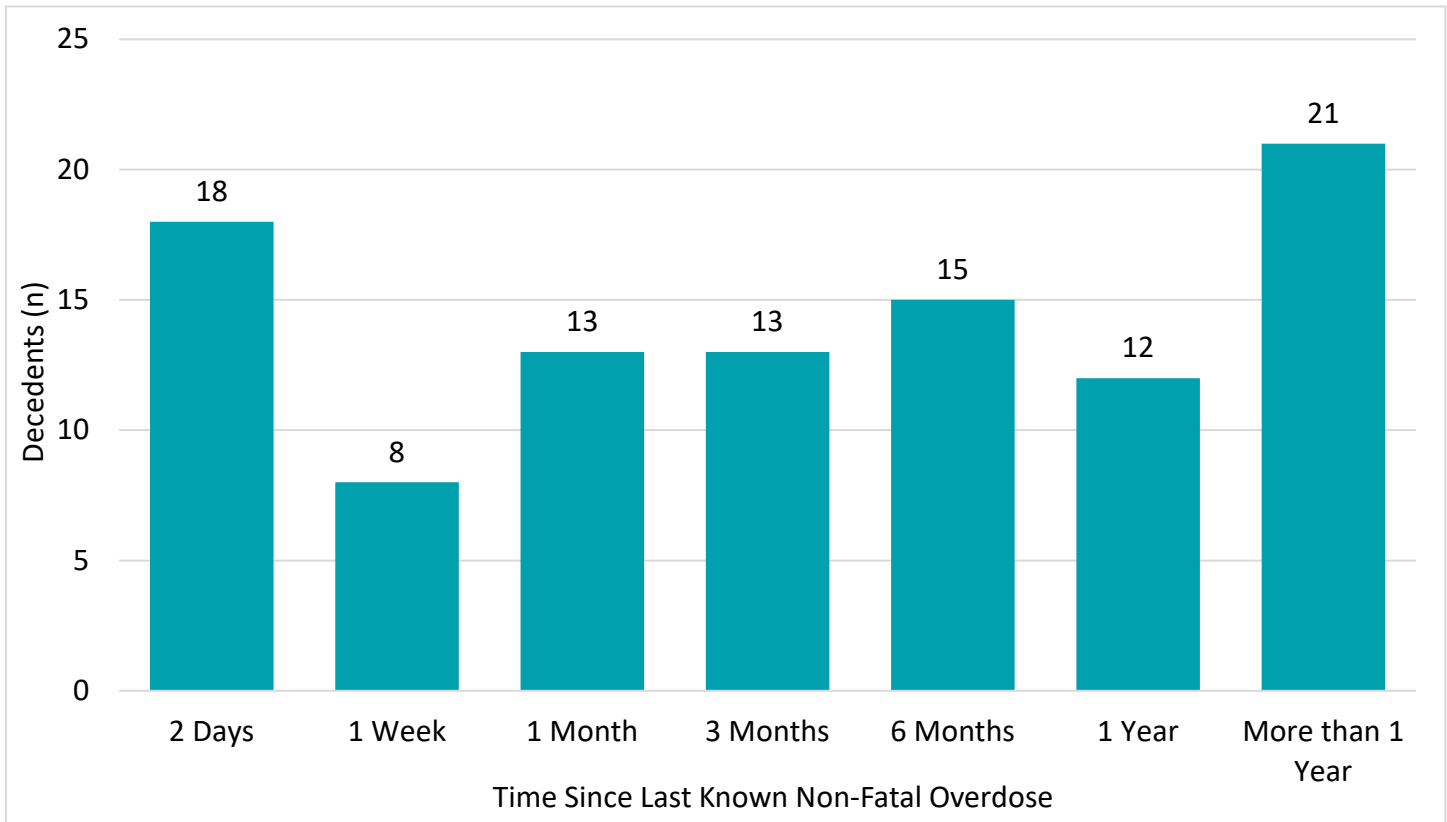
Figure 17: Reported and Presumed Use of Medications for Opioid Use Disorder



DECEDENTS WITH PRIOR NON-FATAL OVERDOSE

At least 24.3% of decedents (n=140) were known to have survived a prior overdose. Using dates provided from next-of-kin data and hospital records, date of last non-fatal overdose could be determined for 100 decedents. The figure below shows the time since the last known non-fatal overdose. These non-fatal events indicate potential missed opportunities to engage patients in treatment and harm reduction. A quarter of decedents (n=26, 26.0%) were treated for a non-fatal overdose within one week of their fatal overdose. Only 7 of the 140 decedents with a known history of overdose had naloxone, the opioid overdose reversal agent.

Figure 18: Time Since Decedent's Last Known Non-Fatal Overdose



PUTTING OVERDOSE DATA TO ACTION

This report is an accumulation of many months of data digestion, integration, and validation. OD2A innovative surveillance data provides community-specific analysis of the complex and evolving overdose epidemic. This foundational knowledge drives innovative prevention and early intervention programs, creates effective recommendations, and strengthens the implementation of policies that serve the community. The following section describes the OD2A team's current strategies and recommendations. By continuing to put overdose data to action, OD2A and our community partners are informing ways to address substance use disorder and prevent overdoses. OD2A's ongoing work promises to enact real change to save real lives.

HARM REDUCTION

Harm reduction is an evidence-based prevention strategy employed across a spectrum of public health programs. Harm reduction services such as needle exchange programs, naloxone distribution, and fentanyl test strips have proven successful in reducing drug overdose fatalities among those with substance use disorders¹⁰. These services also reduce stigma and direct toward care when an individual is ready. Data-driven overdose surveillance can monitor trends and spatially analyze areas where harm reduction services can create the most impact in a population. Increasing availability of harm reduction services in PBC hospitals and OD2A community partner organizations is an effective way to combat this fast and evolving epidemic and save lives.

Overdose Fatality Review Committee

Overdose surveillance data collected by OD2A is integrated into the interdisciplinary overdose fatality review (OFR) in PBC. The general purpose of an OFR is to identify systemic gaps and innovative community-specific overdose prevention plans and strategies for early intervention. Fatality reviews are used to address several complex public health issues. Reviews on homicide, child death, maternal mortality, critical incidents, suicide, and overdose deaths share many common components, such as a focus on prevention, convening multidisciplinary teams to conduct case reviews, identification of missed opportunities for prevention and intervention, and development and implementation of data-driven prevention and intervention strategies. OD2A collects and analyzes data on the life course of each OFR decedent. This process generates information about the decedent and his or her interactions with services and systems. Putting overdose data to action, the OFR recommendations subcommittee generates real, actionable recommendations for the community it serves to prevent further overdose morbidity and mortality.

The Palm Beach County OFR comprises a case review subcommittee to select fatal overdose cases for review by the general OFR committee. Upon review, the general committee provides a summary of cases and systemic gaps to the recommendation subcommittee. This third committee develops a comprehensive recommendation and highlights areas for improvement within current and prospective prevention programs and service providers.

ACADEMIC DETAILING/PDMP EDUCATION

Academic detailing is outreach education for healthcare professionals that calls attention to evidence-based interventions to improve quality of patient care. OD2A incorporates local overdose surveillance data in its academic detailing sessions with providers. Integrating OD2A data into detailing sessions can better inform providers of the challenges and barriers for the patients and the community they serve. These one-to-one discussions promote positive changes in patient care, inform health care providers on local overdose trends, and increase cultural competency of providers. Academic detailing also assesses the trends in prescription and overdose data to better inform OD2A's outreach to providers in our county.

The main objective of academic detailing is to increase provider utilization of the Florida PDMP (E-FORSCE®) when prescribing controlled substances. The Florida E-FORSCE® is a database of controlled substance dispensing information¹¹. The purpose of the database is to improve safe prescribing and reduce substance use disorders and drug diversion. Assessing prescription trends county-wide assists in tailoring the interactive detailing visit to the need of the community and bridges gaps between the individual's clinic practice and county-level data.

COMMUNICATING FINDINGS

Overdose surveillance data collected by OD2A is directly informing public health campaigns and community outreach events. Data provided to local OD2A communications personnel can increase the effectiveness of the message reaching the target audience in future public health campaigns. By identifying demographics and characteristics of people who experienced an overdose, and describing regional variations in trends, messaging can be adjusted to the needs of each region.

TECHNICAL NOTES

DATA COLLECTION AND ANALYSIS

Syndromic Surveillance Systems

ESSENCE-FL: De-identified ED data was obtained from ESSENCE-FL. ESSENCE has three functions – data ingestion, reporting, and analysis¹². During data ingestion, hospital CCDD data is received electronically and placed in syndrome groups. The query used for reporting is the CCDD category “Drug-CDC All Drug v2 OD2A,” based on the CDC inclusion and exclusion criteria for overdose¹³. Variables of interest included patient home ZIP Code, date and time of ED visit, data pertaining to CCDD, and patient demographics including age, sex, race, and ethnicity. Microsoft Excel (Microsoft Corporation, Redmond, WA) and SAS Version 9.4 (SAS Institute, Cary, NC) were used for data management and analysis. Spatial analysis was completed using ArcGIS Pro 3.0.1 (ESRI, Redlands, CA).

Biospatial: De-identified EMS data was obtained from Biospatial. Biospatial collects timely EMS electronic patient care report (ePCR) data according to the National EMS Information System (NEMSIS) standard¹⁴. Syndrome definitions for overdose are based on Enhanced State Opioid Overdose Surveillance (ESOOS) criteria as defined by the state of Florida¹⁵. Variables of interest included incident ZIP Code, date and time of overdose EMS response, suspected substances involved, and patient demographics including age, sex, race, and ethnicity. Microsoft Excel (Microsoft Corporation, Redmond, WA) and SAS Version 9.4 (SAS Institute, Cary, NC) were used for data management and analysis. Spatial analysis was completed using ArcGIS Pro 3.0.1 (ESRI, Redlands, CA).

Innovative Fatal Overdose Surveillance

Data Procurement: The PBC Medical Examiner Office provided limited access to medical examiner investigation notes, autopsy findings, and toxicology results for overdose-related deaths. Physical records were securely stored in locking file cabinets behind no fewer than two locked doors. Electronic records were stored securely in Merlin, the state’s communicable disease repository. All patient records were handled in accordance with Health Insurance Portability and Accountability Act (HIPAA) regulations at all times.

Data Abstraction and Analysis: All records were manually reviewed to determine if they met inclusion/exclusion criteria. Records that contained alcohol as the only substance marked in cause of death were excluded. Additionally, deaths that did not include at least one illicit substance or drug with high potential for abuse were excluded from analysis. Examples of excluded deaths include:

- Deaths from over-the-counter substances such as acetaminophen, salicylates, or antihistamines;
- Deaths from prescription medications that are not typically used in an illicit manner such as antidepressants, antihypertensives, or diuretics;
- Deaths from inhalant of chemicals such as carbon monoxide and 1,1 difluoroethane, or the ingestion of chemical compounds such as antifreeze.

Records that met fatal overdose inclusion requirements underwent abstraction, and a wide range of variables were extracted. A unique patient ID was assigned to each patient to protect patient privacy. Variables extracted include but were not limited to demographics, lifestyle characteristics, health history, social history, substance use and treatment history, and history of law enforcement interactions. Supplemental data was obtained through the data sources found in [Table 2](#) of the Appendix. Microsoft Excel (Microsoft Corporation, Redmond, WA) and SAS Version 9.4 (SAS Institute, Cary, NC) were used for data management and analysis. Spatial analysis was completed using ArcGIS Pro 3.0.1 (ESRI, Redlands, CA).

LIMITATIONS

The limitations presented below are non-exhaustive.

During the data collection process for 2021, suspected overdoses (both fatal and non-fatal) were not a reportable condition in Florida. Thus, participation in the OD2A PBC innovative surveillance initiative is voluntary. The partnership with Palm Beach County Medical Examiner Office (MEO) has largely facilitated fatal overdose surveillance in Palm Beach County (PBC). One advantage of the MEO is its single centralized location, compared to other jurisdictions, which might have multiple MEO entities. This helps ensure that overdose death data is complete and consistent. Unlike the MEO, hospitals in PBC are owned by different entities. This can result in inconsistent reporting and standardization across hospitals areas like racial/ethnic grouping, diagnostics codes, data reported, etc.

The data presented in this report is an aggregation of multiple data sources. The purpose of this was to provide a comprehensive and holistic approach to drug overdose surveillance in Palm Beach County, FL. This report is based on information available at the time the data was collected.

Limitations of fatal overdose data include the secondary collection of data from reports, investigator notes, and lab results. No patient or next-of-kin interviews were conducted. Furthermore, information reported by the next-of-kin to the medical examiner is subject to response or social desirability bias among others. Additionally, details such as the age the decedent first used substances might be inaccurately reported if substance use was concealed from friends and family. Any interpretation should consider possible bias, under/overreporting, and other consequences of the widespread prevalence of stigma towards people with SUD.

ABBREVIATIONS AND DEFINITIONS

Abbreviations

ACEs	Adverse Childhood Experiences
ADHD	Attention Deficit Hyperactivity Disorder
AMA	Against Medical Advice (i.e. “left AMA”)
ASU	Addiction Stabilization Unit at JFK Medical Center North Campus
BMI	Body Mass Index
CCDD	Chief Complaint/Discharge Diagnosis
CDC	Centers for Disease Control and Prevention
COD	Cause of Death
DMT	N, N-Dimethyltryptamine
DUI/DWI	Driving Under the Influence/Driving While Intoxicated
ED	Emergency Department
EMS	Emergency Medical Services
ESSENCE	Electronic Surveillance System for the Early Notification of Community-Based Epidemics
FDOH	Florida Department of Health
GHB	Gamma Hydroxybutyrate
HCD	Health Care District
HIPAA	Health Insurance Portability and Accountability Act
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
IVDU	Intravenous Drug Use
LSD	Lysergic Acid Diethylamide
MAT	Medication Assisted Treatment
MDMA	3,4 - methylenedioxymethamphetamine
MEO	Medical Examiner Office
MOUD	Medications for Opioid Use Disorder
MRSA	Methicillin Resistant Staphylococcus Aureus
NAS	Neonatal Abstinence Syndrome
NH	Non-Hispanic
NPE	N-Pyrrolidino Etonitazene
OD	Overdose
OD2A	Overdose Data to Action
OFR	Overdose Fatality Review
OUD	Opioid Use Disorder
PBC	Palm Beach County
PDMP	Prescription Drug Monitoring Program
PTSD	Post-Traumatic Stress Disorder
PWID	People Who Inject Drugs
PWUD	People Who Use Drugs
RX	Prescription
SOOTM	Synthetic Opioids Other Than Methadone
STARS	Surveillance Tools and Reporting System
STD	Sexually Transmitted Disease
SUD	Substance Use Disorder

Definitions

Amphetamines: Stimulants commonly prescribed to treat certain medical conditions such as ADHD or narcolepsy and carrying a potential for abuse. Examples: Adderall, Ritalin, Vyvanse.

Baker Act: The Florida Baker Act allows doctors, mental health professionals, judges, and law enforcement to commit a person to a mental health treatment center for up to 72 hours if they display certain violent or suicidal signs of mental illness.

Benzodiazepines: Depressants commonly prescribed to treat certain medical conditions such as anxiety or insomnia and carrying the potential for abuse. Examples: Xanax, Valium, Klonopin.

Buprenorphine: A partial opioid agonist prescribed to treat opioid use disorder as well as long term pain management. Examples: Subutex, Suboxone, Sublocade.

Cocaine: An illicit stimulant found as a powdery substance or in a crystalline form as crack.

Fentanyl: A synthetic opioid 50 to 100 times more potent than morphine, originally used in medical settings to treat severe pain, and now dominating the illicit opioids supply.

Gamma hydroxybutyrate (GHB): A psychoactive designer drug often used as a party drug in bars, nightclubs, and raves. Also known as a “date rape drug” or as Liquid Ecstasy.

Harm Reduction: A set of strategies and ideas to reduce negative consequences associated with drug use. Examples: safe prescribing practices, clean syringe programs, naloxone distribution.

Heroin: An illicit opioid processed from morphine that rose to prominence in 2010 as a cheaper alternative to the diversion of prescription opioids.

Ketamine: A powerful anesthetic originally used by veterinarians that has become popular as a party drug. Also known as “Special K.”

Kratom: A psychoactive herbal substance that can cause produce opioid and stimulant-like effects.

Lysergic Acid Diethylamide (LSD): A psychedelic drug also known for its hallucinogenic affect and altered sensory perception. Also known as “acid.”

Marchman Act: A civil and involuntary commitment statute in the state of Florida that provides means to voluntarily or involuntarily commit those who are struggling with a substance use disorder.

Medication for Opioid Use Disorder (MOUD): An evidence-based approach to treat opioid use disorder that combines the use of FDA-approved medications with counseling and behavioral therapies.

Methadone: A synthetic opioid prescribed to treat opioid use disorder and manage chronic pain.

Methamphetamine: An illicit stimulant that takes the form of a white odorless powder or in a crystalline form as crystal meth.

N, N-Dimethyltryptamine (DMT): A hallucinogenic similar to psilocybin, or “magic mushroom.”

Naloxone: An opioid antagonist used to rapidly reverse the effects of an opioid overdose. Examples include the nasal spray, Narcan, and the auto injectable, Evzio.

Naltrexone: An opioid antagonist medication prescribed to treat opioid and alcohol use disorder. Examples include Vivitrol and Revia.

Opiates: A class of opioids naturally derived from the poppy plant. Examples: morphine, codeine, heroin.

Opioids: A class of drug that acts on receptors to reduce pain and carry a potential for abuse. They encompass naturally derived opiates, as well as synthetic and semi-synthetic opioids. Examples: fentanyl, heroin, Oxycodone.

Stigma: A set of negative attitudes or beliefs that can lead to labeling, stereotypes, and discrimination.

Suboxone (Buprenorphine/Naloxone): A sublingual medication prescribed to treat opioid use disorder that combines the partial agonist buprenorphine with the antagonist naloxone.

Syndromic Surveillance: Gathers information about patient's symptoms during the early phases of illness.

Synthetic Cathinones: A class of novel psychoactive substances designed to mimic other illicit drugs, also known as "Flakka" or "bath salts."

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APPENDIX

Table 2: Supplemental Data Sources for Innovative Overdose Surveillance

Data Source	Purpose/Information
Biospatial	EMS response narrative, demographics, health information, and incident ZIP Code
ESSENCE-FL	ED visits including CCDD data, past ED visits, demographics, health information, and patient ZIP Code
FL Shots	Vaccination history
LexisNexis- Accurint for Government	Address history, arrest history, court history, work history, and driver's license issue state
Merlin	Florida reportable disease case reports, overdose data, and information on reportable diseases/conditions
STARS	Sexually transmitted disease history
Vital Statistics	Vital statistics and death certificate information

Table 3: Decedent Characteristics

Decedent Characteristics			
<i>Sex</i>	<i>n (%)</i>	<i>Occupations (Most Reported)</i>	<i>n (%)</i>
Female	160 (27.73)	Retail/Sales	91 (15.77)
Male	417 (72.27)	Construction	84 (14.56)
<i>Pregnancy</i>		Hospitality/Food and Beverage	65 (11.27)
Pregnant at Time of Death	2 (0.35)	Healthcare	38 (6.59)
Pregnant within 1 Year of Death	4 (0.69)	Education	30 (5.2)
<i>Race/Ethnicity</i>		Farming/Agriculture/Landscaping	23 (3.99)
White/NH	441 (76.43)	Automotive	20 (3.47)
Black/NH	55 (9.53)	Business/Finance	15 (2.6)
Hispanic	76 (13.17)	Design/Manufacturing	15 (2.6)
Other	5 (0.87)	Homemaker	14 (2.43)
<i>Residency</i>		<i>Special Circumstances</i>	
Palm Beach County	484 (83.88)	US Military Service	29 (5.03)
Broward County	8 (1.39)	Disabled	22 (3.81)
Martin County	5 (0.87)	Student (Adult)	18 (3.12)
Miami-Dade County	5 (0.87)		
Another County in Florida	20 (3.47)		
Another State	55 (9.53)		

Table 4: Decedent Characteristics by Sex and Race/Ethnicity

	Sex		Race/Ethnicity			
	Female	Male	White/NH	Black/NH	Hispanic	Other/NH
Education	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
8th Grade or Less	4 (2.5)	14 (3.36)	7 (1.59)	4 (7.27)	7 (9.21)	0 (0)
9th-12th Grade	17 (10.63)	54 (12.95)	39 (8.84)	22 (40)	10 (13.16)	0 (0)
High School Diploma	64 (40)	201 (48.2)	213 (48.3)	15 (27.27)	37 (48.68)	0 (0)
Some College	34 (21.25)	72 (17.27)	88 (19.95)	7 (12.73)	7 (9.21)	4 (80)
Associate Degree	19 (11.88)	24 (5.76)	31 (7.03)	5 (9.09)	7 (9.21)	0 (0)
Bachelor's Degree	15 (9.38)	34 (8.15)	41 (9.3)	1 (1.82)	6 (7.89)	1 (20)
Master's Degree	2 (1.25)	0 (0)	2 (0.45)	0 (0)	0 (0)	0 (0)
Doctoral Degree	1 (0.63)	2 (0.48)	3 (0.68)	0 (0)	0 (0)	0 (0)
Unknown	4 (2.5)	16 (3.84)	17 (3.85)	1 (1.82)	2 (2.63)	0 (0)
Special Circumstances						
Military	2 (1.25)	27 (6.47)	28 (6.35)	0 (0)	1 (1.32)	0 (0)
Disability	7 (4.38)	15 (3.6)	16 (3.63)	4 (7.27)	2 (2.63)	0 (0)
Housing Stability						
Stable Housing	127 (79.38)	271 (64.99)	302 (68.48)	35 (63.64)	57 (75)	4 (80)
Unstable/Transitional	18 (11.25)	91 (21.82)	91 (20.63)	9 (16.36)	8 (10.53)	1 (20)
Homeless/Unhoused	8 (5)	37 (8.87)	34 (7.71)	7 (12.73)	4 (5.26)	0 (0)
Unknown	7 (4.38)	18 (4.32)	14 (3.17)	4 (7.27)	7 (9.21)	0 (0)
Law Enforcement Interactions						
Overall (Any Category)	99 (61.88)	321 (76.98)	318 (72.11)	47 (85.45)	50 (65.79)	5 (100)
Drug Possession	65 (40.63)	211 (50.6)	206 (46.71)	34 (61.82)	35 (46.05)	1 (20)
Drug Paraphernalia	53 (33.13)	123 (29.5)	131 (29.71)	19 (34.55)	25 (32.89)	1 (20)
Drug Possession w/Intent to Sell	19 (11.88)	63 (15.11)	57 (12.93)	20 (36.36)	5 (6.58)	0 (0)
DUI/DWI	24 (15)	106 (25.42)	106 (24.04)	6 (10.91)	16 (21.05)	2 (40)
Disorderly Conduct	12 (7.5)	56 (13.43)	53 (12.02)	9 (16.36)	5 (6.58)	1 (20)
Acts of Violence	40 (25)	149 (35.73)	136 (30.84)	28 (50.91)	24 (31.58)	1 (20)
Theft	60 (37.5)	178 (42.69)	176 (39.91)	36 (65.45)	23 (30.26)	3 (60)
Child Abuse or Child Endangerment	9 (5.63)	12 (2.88)	14 (3.17)	5 (9.09)	2 (2.63)	0 (0)
Prostitution	12 (7.5)	1 (0.24)	11 (2.49)	1 (1.82)	1 (1.32)	0 (0)

Table 5: Mental and Physical Health Characteristics by Sex and Race/Ethnicity

	Sex		Race/Ethnicity			
	Female	Male	White/NH	Black/NH	Hispanic	Other
<i>Mental Health Condition</i>	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
ADHD	2 (1.25)	7 (1.68)	6 (1.36)	2 (3.64)	1 (1.32)	0 (0)
Anxiety	42 (26.25)	53 (12.71)	84 (19.05)	1 (1.82)	9 (11.84)	1 (20)
Bipolar	24 (15)	25 (6)	38 (8.62)	5 (9.09)	6 (7.89)	0 (0)
Depression	63 (39.38)	102 (24.46)	137 (31.07)	8 (14.55)	19 (25)	1 (20)
PTSD	5 (3.13)	10 (2.4)	12 (2.72)	1 (1.82)	2 (2.63)	0 (0)
Unspecified Condition	3 (1.88)	4 (0.96)	5 (1.13)	1 (1.82)	1 (1.32)	0 (0)
Other Condition	6 (3.75)	20 (4.8)	20 (4.53)	5 (9.09)	1 (1.32)	0 (0)
<i>Physical Health Condition</i>						
Diabetes	11 (6.88)	27 (6.47)	30 (6.8)	5 (9.09)	3 (3.95)	0 (0)
Cancer	7 (4.38)	6 (1.44)	11 (2.49)	0 (0)	2 (2.63)	0 (0)
Chronic Pain	36 (48)	22.5 (11.51)	71 (16.1)	3 (5.45)	10 (13.16)	0 (0)
Hypertension	31 (19.38)	77 (18.47)	84 (19.05)	14 (25.45)	10 (13.16)	0 (0)
Sleep-Related Conditions	9 (5.63)	16 (3.84)	22 (4.99)	2 (3.64)	1 (1.32)	0 (0)
Hepatitis A	0 (0)	4 (0.96)	1 (0.23)	3 (5.45)	0 (0)	0 (0)
Hepatitis B	3 (1.88)	10 (2.4)	8 (1.81)	4 (7.27)	0 (0)	1 (20)
Hepatitis C	44 (27.5)	95 (22.78)	126 (28.57)	2 (3.64)	10 (13.16)	1 (20)
HIV	2 (1.25)	1 (0.24)	2 (0.45)	1 (1.82)	0 (0)	0 (0)
Other STDs	28 (17.5)	39 (9.35)	39 (8.84)	20 (36.36)	8 (10.53)	0 (0)
MRSA	7 (4.38)	5 (1.2)	13 (2.95)	0 (0)	0 (0)	0 (0)
<i>Substance Use History</i>						
Substance Use History	145 (90.63)	403 (96.64)	422 (95.69)	51 (92.73)	70 (92.11)	5 (100)
Injection Drug Use	46 (28.75)	151 (36.21)	168 (38.1)	4 (7.27)	22 (28.95)	3 (60)
Previous Overdose	41 (25.63)	99 (23.74)	115 (26.08)	6 (10.91)	17 (22.37)	2 (40)
Treatment History	72 (45)	196 (47)	230 (52.15)	9 (16.36)	26 (34.21)	3 (60)

Note: "Other" mental health conditions include eating disorders, OCD, personality disorders, and behavior disorders, among others.

Table 6: Overdose Responding Jurisdictions

Overdose Response			
<i>Police Jurisdiction</i>	n (%)	<i>EMS Jurisdiction</i>	n (%)
Palm Beach County Sheriff Office	269 (46.62)	Palm Beach County	274 (47.49)
West Palm Beach	67 (11.61)	West Palm Beach	65 (11.27)
Delray Beach	40 (6.93)	Delray Beach	42 (7.28)
Boynton Beach	36 (6.24)	Boynton Beach	34 (5.89)
Boca Raton	35 (6.07)	Boca Raton	34 (5.89)
Lantana	24 (4.16)	Riviera Beach	23 (3.99)
Riviera Beach	23 (3.99)	Palm Beach Gardens	15 (2.6)
Palm Beach Gardens	18 (3.12)	Greenacres	11 (1.91)
Jupiter	17 (2.95)	North Palm Beach	2 (0.35)
Palm Springs	16 (2.77)	Hendry County	1 (0.17)
Atlantis	3 (0.52)	Multiple	8 (1.39)
Lake Clarke Shores	3 (0.52)	No Fire Rescue Listed	68 (11.79)
North Palm Beach	3 (0.52)		
Multiple	5 (0.86)		
No Police Department Listed	18 (3.12)		

Table 7: Overdose Event

Overdose Event			
<i>Location of Overdose</i>	n (%)	<i>Manner of Death</i>	n (%)
Decedent's Residence	340 (58.93)	Accident	552 (95.67)
Other's Residence	65 (11.27)	Suicide	23 (3.99)
Gas Station	6 (1.04)	Undetermined	2 (0.35)
Sober Living Facility	20 (3.47)	Potential Bystander Present	
Hospital	1 (0.17)	Potential Bystander Present	115 (19.93)
Motel/Hotel	69 (11.96)	Multi-Person Overdose Event	16 (2.77)
SUD Treatment Facility	4 (0.69)	Double Fatal Overdose Event	8 (1.39)
Restaurant/Food Service	9 (1.56)	Intervention Attempts	
Other Business	35 (6.07)	CPR/Rescue Breathing	191 (33.10)
Outside/Street	20 (3.46)	Defibrillation	115 (19.93)
Other	7 (1.21)	Epinephrine	73 (12.65)
Unknown	1 (0.17)	Naloxone	123 (21.32)

Table 8: Cause of Death

	Sex		Race/Ethnicity			
	Female	Male	White/NH	Black/NH	Hispanic	Other/NH
Number of Substances	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Single Substance	42 (26.25)	140 (33.57)	140 (31.75)	18 (32.73)	22 (28.95)	2 (40)
Polysubstance	118 (73.75)	273 (65.47)	298 (67.57)	37 (67.27)	54 (71.05)	2 (40)
Manner of Death						
Accident	145 (90.63)	407 (97.60)	420 (95.24)	54 (98.18)	73 (96.05)	5 (100.00)
Suicide	14 (8.75)	9 (2.16)	20 (4.54)	0 (0)	3 (3.95)	0 (0)
Undetermined	1 (0.63)	1 (0.24)	1 (0.23)	1 (1.82)	0 (0)	0 (0)
Cause of Death						
Fentanyl	116 (72.5)	352 (84.41)	358 (81.18)	42 (76.36)	65 (85.53)	3 (60)
Acetylfentanyl	27 (16.88)	72 (17.27)	79 (17.91)	7 (12.73)	12 (15.79)	1 (20)
Butyrylfentanyl	1 (0.63)	6 (1.44)	6 (1.36)	0 (0)	1 (1.32)	0 (0)
Heroin	11 (6.88)	21 (5.04)	23 (5.22)	2 (3.64)	7 (9.21)	0 (0)
Oxycodone	24 (15)	35 (8.39)	48 (10.88)	6 (10.91)	5 (6.58)	0 (0)
Morphine	6 (3.75)	9 (2.16)	13 (2.95)	0 (0)	2 (2.63)	0 (0)
Buprenorphine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Codeine	0 (0)	1 (0.24)	1 (0.23)	0 (0)	0 (0)	0 (0)
Hydrocodone	3 (1.88)	4 (0.96)	5 (1.13)	1 (1.82)	1 (1.32)	0 (0)
Hydromorphone	0 (0)	2 (0.48)	2 (0.45)	0 (0)	0 (0)	0 (0)
Methadone	7 (4.38)	9 (2.16)	13 (2.95)	0 (0)	3 (3.95)	0 (0)
Fluorofentanyl	1 (0.63)	7 (1.68)	3 (0.68)	2 (3.64)	3 (3.95)	0 (0)
NPE	6 (3.75)	12 (2.88)	14 (3.17)	0 (0)	4 (5.26)	0 (0)
Metonitazene	1 (0.63)	2 (0.48)	3 (0.68)	0 (0)	0 (0)	0 (0)
EtOH	25 (15.63)	73 (17.51)	61 (13.83)	15 (27.27)	21 (27.63)	1 (20)
Amphetamines	3 (1.88)	3 (0.72)	3 (0.68)	1 (1.82)	2 (2.63)	0 (0)
Alprazolam	16 (10)	26 (6.24)	32 (7.26)	3 (5.45)	7 (9.21)	0 (0)
Clonazepam	3 (1.88)	3 (0.72)	4 (0.91)	0 (0)	2 (2.63)	0 (0)
Cocaine	50 (31.25)	114 (27.34)	114 (25.85)	27 (49.09)	21 (27.63)	2 (40)
Ketamine	3 (1.88)	0 (0)	3 (0.68)	0 (0)	0 (0)	0 (0)
Lorazepam	1 (0.63)	1 (0.24)	1 (0.23)	1 (1.82)	0 (0)	0 (0)
Mitragynine	6 (3.75)	24 (5.76)	26 (5.9)	1 (1.82)	3 (3.95)	0 (0)
MDMA	0 (0)	1 (0.24)	1 (0.23)	0 (0)	0 (0)	0 (0)
Methamphetamine	6 (3.75)	21 (5.04)	27 (6.12)	0 (0)	0 (0)	0 (0)
Xylazine	6 (3.75)	29 (6.95)	25 (5.67)	4 (7.27)	6 (7.89)	0 (0)
Zolpidem	2 (1.25)	1 (0.24)	1 (0.23)	0 (0)	2 (2.63)	0 (0)
Other Opioid	5 (3.13)	11 (2.64)	14 (3.17)	1 (1.82)	1 (1.32)	0 (0)
Other Benzo	7 (4.38)	6 (1.44)	13 (2.95)	0 (0)	0 (0)	0 (0)
Other Stimulant	2 (1.25)	5 (1.2)	5 (1.13)	1 (1.82)	1 (1.32)	0 (0)
Other Rx	11 (6.875)	6 (1.44)	14 (3.17)	1 (1.82)	2 (2.64)	0 (0)
Other OTC	8 (5)	5 (1.2)	28 (6.35)	0 (0)	3 (3.95)	0 (0)
Other (Not grouped)	1 (0.63)	2 (0.48)	3 (0.68)	0 (0)	0 (0)	0 (0)
Unknown	0 (0)	4 (0.96)	3 (0.68)	0 (0)	0 (0)	1 (20)

Table 9: Positive Toxicology Findings (Qualitative Results)

Group	Analyte Name	n (%)	Group	Analyte Name	n (%)
Volatiles	Volatiles (Any)	165 (28.6)	Designer Opioids	Designer Opioids (Any)	322 (55.81)
	Ethanol	164 (28.42)		4-ANPP	319 (55.29)
	Acetone	3 (0.52)		Acetylfentanyl	100 (17.33)
Amphetamines	Amphetamine (Any)	83 (14.38)		Butyrfentanyl	7 (1.21)
	Amphetamine	67 (11.61)		Methoxyacetylfentanyl	2 (0.35)
	Methamphetamine	50 (8.67)		Fluorofentanyl	8 (1.39)
	MDMA	4 (0.69)		Acrylfentanyl	2 (0.35)
	Other Amphetamines	5 (0.87)	Novel Psychoactive	Novel Psychoactive (Any)	34 (5.89)
Analgesics	Analgesics (Any)	72 (12.48)		Metonitazene	3 (0.52)
	Acetaminophen	24 (4.16)		Eutylone	2 (0.35)
	Other Analgesics	53 (9.19)		N-Pyrrolidino Etonitazene	19 (3.29)
Anesthetics	Anesthetics (Any)	9 (1.56)		Etizolam	9 (1.56)
	Ketamine	6 (1.04)		Pentylone	2 (0.35)
	Other Anesthetics	8 (1.39)	Opioid Analgesics	Opioid Analgesics (Any)	536 (92.89)
Anticholinergics	Anticholinergics (Any)	1 (0.17)		6-Acetylmorphine	7 (1.21)
Anticonvulsants	Anticonvulsants (Any)	91 (15.77)		6-Beta-Naltrexol	3 (0.52)
	Gabapentin	66 (11.44)		6-Monoacetylemorphine	26 (4.51)
	Pregabalin	2 (0.35)		Buprenorphine	21 (3.64)
	Lamotrigine	9 (1.56)		Codeine	29 (5.03)
	Levetiracetam	6 (1.04)		Dextromethorphan	6 (1.04)
	Topiramate	12 (2.08)		Dihydrocodeine	9 (1.56)
	Oxcarbazepine	11 (1.91)		EDDP	17 (2.95)
Antidepressants	Antidepressants (Any)	112 (19.41)		Fentanyl	478 (82.84)
Antihistamines	Antihistamines (Any)	62 (10.75)		Hydrocodone	17 (2.95)
Antipsychotics	Antipsychotics (Any)	32 (5.55)		Hydromorphone	37 (6.41)
Barbiturates	Barbiturates (Any)	4 (0.69)		Methadone	21 (3.64)
Benzodiazepines	Benzodiazepines (Any)	216 (37.44)		Morphine	124 (21.49)
	7-Amino Clonazepam	52 (9.01)		Naloxone	101 (17.5)
	a-OH Alprazolam	114 (19.76)		Naltrexone	4 (0.69)
	Alprazolam	125 (21.66)		Norbuprenorphine	30 (5.2)
	Clonazepam	7 (1.21)		Norfentanyl	420 (72.79)
	Diazepam	14 (2.43)		Desmethyltramadol	20 (3.47)
	Lorazepam	21 (3.64)		Oxycodone	75 (13)
	Nordiazepam	23 (3.99)		Oxymorphone	72 (12.48)


	Oxazepam	27 (4.68)		Tramadol	30 (5.2)
	Temazepam	32 (5.55)	Sedatives	Sedatives (Any)	9 (1.56)
Cannabinoids	Cannabinoids (Any)	211 (36.57)		Zolpidem	7 (1.21)
Cardiovasculars	Cardiovasculars (Any)	26 (4.51)	Stimulants	Stimulants (Any)	475 (82.32)
Miscellaneous	Levamisole	22 (3.81)		Benzoylcegonine	325 (56.33)
	Mitragynine (Kratom)	55 (9.53)		Cocaethylene	31 (5.37)
Muscle Relaxant	Muscle Relaxant (Any)	60 (10.4)		Cocaine	131 (22.7)
	Xylazine	39 (6.76)	Urologicals	Urologicals (Any)	7 (1.21)
	Cyclobenzaprine	14 (2.43)			
	Other Muscle Relaxants	8 (1.39)			

Note: Toxicology was conducted on blood, tissue, and vitreous fluid depending on availability of the sample and condition of the decedent. Positive toxicology results do not imply that the substance was involved in death, only that the substance was identified in the sample. Cause of death in this report was determined by Palm Beach County medical examiners. Substances listed in this report were included based on significance and relativity to the overdose event. This list is not exhaustive and there may be positive toxicology results for substances other than what is shown in this table.

Contact Information

OD2A is a collaborative initiative led by the Florida Department of Health Palm Beach County and the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.

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Thank You

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We gratefully acknowledge all organizations in the extensive list of community partners we have worked with throughout the county. Our shared goals are made stronger by our partnerships.

Visit [OvercomeOverdosePBC](https://www.overcomeoverdosepbc.com) or scan the QR code below to view past OD2A reports, hear *real* stories of recovery in Florida, and learn more about how OD2A is working with community partners to reduce overdose deaths in Palm Beach County.

Together we can overcome overdose.



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