



Cook County DEPT. of  
**Public Health**  
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REPORT

# Opioid Epidemic in Suburban Cook County

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## Executive Summary

Despite modest changes in the prevalence of opioid use in the past two decades (SAMSHA, 2019; SAMSHA, 2020), the number of opioid related deaths in the U.S. has increased almost seven-fold since the year 2000, from 2.1 per 100,000 people to 14.4 per 100,000 people in 2018 (CDC WONDER, 2020). While there are multiple reasons for the sharp increase in mortality, a primary driver is the introduction of fentanyl, its analogs, and other adulterants in opioids obtained in the unregulated drug market.

In the municipalities covered under the Cook County Department of Public Health's jurisdiction (CCDPH; referred to as suburban Cook County in this report), 1,576 people have died from opioid overdoses since 2016. While national data shows that only 8% of persons who misuse opioids use heroin and its illegal adulterants (including fentanyl and its analogs), of the 1,576 deaths, 82.9% of the opioid fatal overdoses involved heroin and/or fentanyl.

In addition to the incalculable cost of human lives and the impacts to their families, friends, and communities, there is a high economic burden resulting from opioid use disorders and conditions induced by opioid use. From 2016 through 2019, the cumulative hospital charges to treat suburban Cook County residents for any opioid related issues (including

medical conditions induced by opioid use, withdrawal and treatment) was almost \$800 million. Of which, treatment of acute opioid intoxication-overdose cases alone exceeded \$500 million in hospital charges.

This report analyzed four health data systems to characterize the opioid epidemic among residents covered under the CCDPH jurisdiction. The datasets utilized for this analysis included data from the Illinois Poison Center, hospital outpatient emergency department (ED) visits that do not result in a hospital admission, hospital inpatient admissions, and the Cook County Medical Examiner's Office. No single dataset fully characterizes the problem of the opioid epidemic in Cook County, and individual characteristics and types of opioids differ in each dataset. However, the aggregate of information gathered across all the datasets provides the most comprehensive picture.

This report focuses on cases of acute intoxication-overdose from January 2016 through June 15, 2020. The characteristics of persons seeking care for conditions induced by chronic opioid use (e.g. withdrawal, substance use treatment, and concomitant conditions) are summarized at the end of the report.

### KEY FINDINGS

- Suburban Cook County mortality rates from opioid overdoses are similar to overall rates reported in the U.S., although some areas of suburban Cook County have rates that are similar to some of the highest rates in the U.S.
- There was a sharp increase in opioid overdose mortality rates among Black/African-American residents, particularly middle-aged men ages 35 to 64 years of age. This increase mirrors national trends also showing a marked rise beginning in 2016 (CDC, 2019; AHRQ, 2020).
- **Hospitalization and mortality rates were more than two times lower among Hispanic/Latinx residents compared to Black/African-American and white non-Hispanic residents.** This corresponds with national mortality data, which shows the rate of opioid use is nearly equivalent between Black/African-Americans and Hispanic/Latinx residents.
- **Women represented a majority of cases in poison center and inpatient data. Men represented a majority of cases in the outpatient ED and medical examiner data.**
- **White non-Hispanic middle-aged women have shown a decline in admissions, a plateauing in outpatient ED visits towards the end of 2017, and no change in deaths.** This indicates that there may be a plateauing or decline in incidence within this subgroup which may be attributable to changes in prescription



patterns. Data shows that women are more likely to receive prescription opioids, but overall prescriptions for opioids across all patients has declined by 20% since 2016.

- **Most cases of opioid-related overdose (86.3 percent) reported by the Medical Examiner's Office involved more than one drug exposure.** Of the 1,576 deaths reported, 677 (43.0%) cases were also exposed to at least one additional respiratory depressant or drug that causes excessive drowsiness, such as ethanol, barbiturates, or benzodiazepines. When used with opioids, these drugs increase the risk of respiratory arrest or ingestion of fluids into the lungs, which can cause lung infection or inflammation.
- The ZIP codes with the highest mortality rates were primarily located in the west and southwest suburbs and are adjacent to communities on the west side of

Chicago – an area with similarly high mortality rates. The **highest mortality rates were observed in ZIP codes that principally contain the following municipalities: Worth, Broadview, Maywood and Forest Park.** The ZIP codes hit hardest by the opioid epidemic have substantially lower median household incomes (\$56,430 vs. \$79,313) and correspondingly higher poverty rates (12.7% vs 7.8%).

- Although 71.7% of outpatient ED cases reported acute exposure to heroin, only 21.4% had a diagnosis for a substance use disorder. The data indicates that assessments for substance use disorders may not be occurring during most outpatient ED visits involving acute opioid intoxication, and is further indication that there's a need to establish better systems for regular screening, referral, and initiation of SUD treatment in the ED setting.

While the Cook County Department of Public Health's (CCDPH)'s suburban jurisdiction does not include the municipalities of Chicago, Evanston, Oak Park, Skokie, and Stickney Township, in parts of the report we have included data for all of Cook County to contextualize the data which has adversely impacted our entire county. We also provide data for Illinois and the U.S., where appropriate. Opioid use and substance use disorder are one of the most highly stigmatized behaviors in our society. We have been careful to avoid language that perpetuates this stigmatization, which results in reduced care-seeking, poor quality of care, and access to vital resources, like housing. In cases where we reference "opioid misuse" and "illicit", these refer to terminology used in the research that we are citing.

This analysis demonstrates that patterns of opioid use disorder, individual characteristics, and outcomes vary across suburban Cook County. Persons with opioid use disorders are not a homogenous group. CCDPH will use this analysis to inform our activities and customize intervention programs to target the needs of different subgroups of persons with opioid use disorders. Our hope is that by sharing this with community stakeholders, we can leverage our collective expertise and resources to address this crisis.

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# Methods & Definitions

(A detailed methods section is available as an appendix)

The research team gathered data from three sources: the Illinois Poison Center, outpatient ED and inpatient hospital administrative data, and the Cook County Medical Examiner's Office. Each dataset included in this analysis captures a different cross-section of Cook County residents suffering

from acute opioid exposures-overdoses or seeking medical care for opioid use disorder. As a result, the characteristics of the individuals and the types of opioids reported will vary in each dataset. A more detailed description of the methodology used for this report is available in a companion document.

	ILLINOIS POISON CENTER	OUTPATIENT ED/INPATIENT	MEDICAL EXAMINER
Date	January 1, 2016 through June 15, 2020	January 1, 2016 through December 31, 2019	January 1, 2016 through June 15, 2020
Source	National Poison Data System (NPDS)	Illinois Hospital Association (IHA) CompData	Cook County Medical Examiner's Office case archive via the Cook County Government Open Data portal.
Data Type	Calls related to poison prevention and exposure management. Almost all calls come from medical personnel treating an exposed person at a health care facility or by the exposed person.	Outpatient ED data are billing records of all patients treated in emergency rooms for less than 24 hours who were not admitted as an inpatient to the hospital.  Inpatient data are billing records of all patients treated for 24 hours or more in Illinois hospitals for any medical reason.	Acute injury accidents and sudden unexpected natural deaths, and suspected drug overdoses.
Variables	Exposed person's demographics (age, sex), date, substances involved (specific agents), exposure and treatment location, reason for exposure, and clinical outcomes	Patient demographics (age, ethnicity, sex), date, substances involved (agent class), clinical outcomes (diagnoses, hospital procedures, and discharge status), and economic outcomes (hospital charges and payer source)	Fatality demographics (age, gender, ethnicity), manner of death, primary causes of death (open text fields), opioid related death, date, substances involved (specific agents), incident location, residential location
Principal assessment of exposure	Toxidrome	Medical records based on patient reported use, in-hospital screening tools and toxicology exams.	Forensic pathology, initial positive ELISA toxicological analyses are verified through (1) gas chromatography– mass spectrometry (GC-MS) or (2) liquid chromatography–mass spectrometry (LC-MS)
Spatial data	Caller Location ZIP code	Residential ZIP Code	Residential ZIP code and detailed incident location including geolocation
Temporal data	Date of call	Date of Admission / Discharge	Date of Incident and Death
Severity of Cases	Predominately minor cases that do not required therapeutic intervention.	Predominately minor to serious severity cases requiring treatment of symptoms and pharmaceutical, clinical and surgical intervention.	Deaths



## Definitions

### Public Health Jurisdiction

Refers to the agency with authority to provide public health services to local residents. In Cook County, all municipalities not covered by Chicago, Evanston, Oak Park, Skokie, and Stickney Township Departments of Public Health, fall under the jurisdiction of the Cook County Department of Public Health.

### Suburban Cook County (SCC)

Unless otherwise specified in the report, suburban Cook County refers to municipalities that are covered under the jurisdiction of the Cook County Department of Public Health. This excludes municipalities covered by other department of public health jurisdictions including Chicago, Evanston, Oak Park, Skokie, and Stickney Township.

### Drug Misuse

Use of psychotherapeutic drugs, including opioids, in a manner other than as directed by a health professional including taking a substance without a prescription or at an incorrect prescribed dose (higher quantity, greater frequency, or longer duration).

### Substance Use Disorder (SUD)

Generally refers to patients who meet the diagnostic criteria in the DSM-IV or DSM-V for substance abuse or dependence. SUD criteria varies slightly by year and reference source. SUD has replaced more stigmatizing terminology used in the past such as drug addiction, substance abuse and drug dependence.

### Illicit Drug Use

We use this term when citing literature or national surveys that use the term. Otherwise, we use the term "illegal drug use". Illicit drug use generally includes "marijuana, cocaine (including crack), heroin, hallucinogens, inhalants, methamphetamine, or prescription psychotherapeutics that were misused" (SAMSHA, 2019).

### Illegal Drug Use

used interchangeably with the term "illicit drug use". See definition above for "illicit drug use".

### Heroin

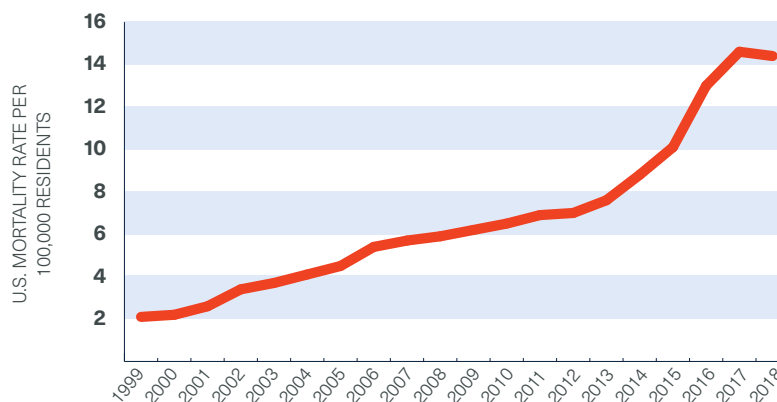
Specifically refers to diacetylmorphine. However, in national surveys and in hospital data, a patient may report using "heroin" when in fact they may be exposed to a broad array of non-opioid and opioid agents, including fentanyl and its analogs.

## SECTION 1 SUMMARY

## Background on Opioid Use Disorder in the United States

- In the U.S., approximately 10-27% of the population will struggle with some form of substance use disorder (SUD) during their lifetime.
- Approximately 10% of the population report misusing prescription opioids at some point in their lifetime, with 2-3% of the U.S. population meeting the criteria for opioid substance use disorder during their lifetime.
- In 2018, 0.8% of the U.S. population met the criteria for opioid substance use disorder.
- Nationally, among persons reporting using opioids in a manner other than as directed by a health professional, 92.1% report exclusively misusing prescription pain relievers as opposed to other illegal opioids which predominately includes heroin and fentanyl.
- Despite only slight changes in opioid use disorder diagnoses and the use of opioids in a manner other than as directed by a health professional, the number of opioid related deaths has increased by almost 7-fold since 2000 from 2.1 per 100,000 to 14.4 per 100,000 in 2018 (CDC WONDER, 2020).
- While there are multiple reasons for the increase in mortality, a principal cause is a marked increase in the proportion of heroin in the illegal drug supply market that contains fentanyl and its analogs, in addition to non-opioid agents and impurities. This increase in exposure to fentanyl and its analogs is correlated with an increased risk of overdose in those exposed.
- While any opioid can result in a substance use disorder after continued use, heroin and fentanyl obtained in the illegal drug supply market tends to be more addictive, more lethal and lead to greater medical complications.
- Heroin is 7-times and fentanyl is over 100-times more potent than morphine. This translates to a lower effective dose to achieve the same level of euphoria and other opioid related adverse physiologic effects. In addition, research indicates that fentanyl is far more addictive relative to both heroin and morphine.
- Each year more studies are showing that the majority of persons who die from an opioid overdose, test positive for multiple agents – multiple opioids, ethanol, and benzodiazepines. The combination of these agents potentiates respiratory depression and arrest which is the primary cause of death in opioid users.

**U.S. Opioid Related Mortality Rate per 100,000 Residents, 1999-2018**





**SECTION 1**


# Background on Opioid Use Disorder in the United States

Substance use disorder is very common in the U.S. population. Nearly all U.S. adults have used alcohol (80.8%) during their lifetime, with 49.2% reporting ever using illicit drugs. The three most commonly used drugs among U.S. adults are alcohol, marijuana and opioids. In 2018, 7.8% of the U.S. population met the criteria for a substance use disorder, with 75% of these individuals suffering from alcohol use disorders. In the U.S., approximately 10-27% of the population will struggle with some form of substance use disorder during their lifetime (Kessler, 1994; Wilson, 2007). Research has demonstrated that the odds for any drug use disorder is significantly higher among males, white non-Hispanics, younger adults, and persons with other comorbid psychiatric conditions (Compton, 2007).

When looking at the use of opioids in a manner other than directed by a health professional, approximately 10% of the population report misusing prescription opioids at some point in their lifetime (Saha, 2016), with approximately 3% reporting opioid misuse in 2018. However, not all of these individuals are diagnosed with substance use disorders (SAMSHA, 2019). An estimated 0.8% of the population in 2018 met the criteria for opioid substance use disorder (SAMSHA, 2019), with 2-3% of the population meeting the criteria for opioid

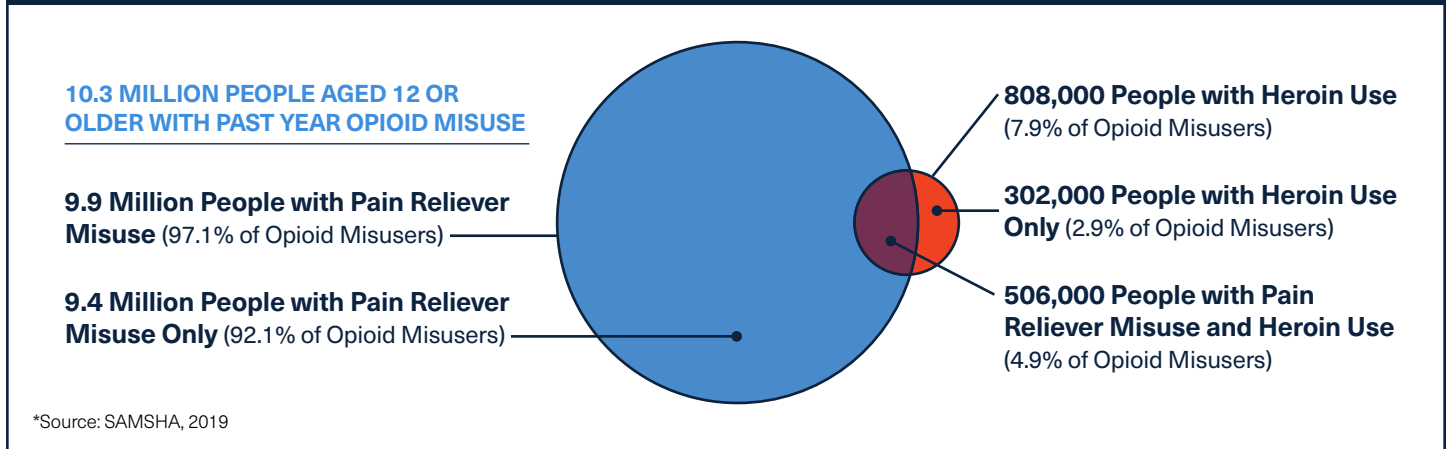
**Substance use disorders are all too common.**

In the U.S., approximately 10-27% of the population will struggle with some form of substance use disorder during their lifetime. In 2018, 7.8% of the U.S. population met the criteria for a substance use disorder, **with 75% of these individuals suffering from alcohol use disorders;** 0.8% of the U.S. population in 2018 met the criteria for opioid use disorder.



substance use disorder during their lifetime (Saha, 2016). Nationally, among persons reporting misuse of opioids, 92.1% report exclusively misusing prescription pain relievers (see Figure 1.1 below; SAMSHA, 2019) as opposed to other illegal opioids which frequently is referred to as heroin. In national surveys, "heroin" includes a broad number of illegally obtained opioids including fentanyl and its analogs, opium and various synthetic opioids such as U-47700 ("pink"). In addition, common coding systems used in hospital and death records do not readily capture information about these other illegal opioids.

**Figure 1.1 Opioid Misuse in Past Year among Persons Aged 12 or Older, SAMSHA/NSDUH U.S. National Estimates, 2018\***





Nationally in 2018, the rate of reported misuse of opioids was slightly less common among females, Black/African-Americans, and Hispanic/Latinxs (see Table 1.1 at right; SAMSHA, 2019). However, SAMSHA does not collect data on lifetime prevalence of opioid misuse like they do for other drugs. In an independent study near the peak of the opioid epidemic, 11.3% of the U.S. population was estimated to have met the criteria for nonmedical prescription opioid misuse at some point in their lifetime (Saha, 2016). The lifetime prevalence of nonmedical prescription opioid misuse for males was 13.0% and females 9.8%; the lifetime prevalence by race/ethnicity was as follows: Black/African-American, 9.9%; Hispanic, 8.1%; and white non-Hispanic, 12.8% (Saha, 2016).

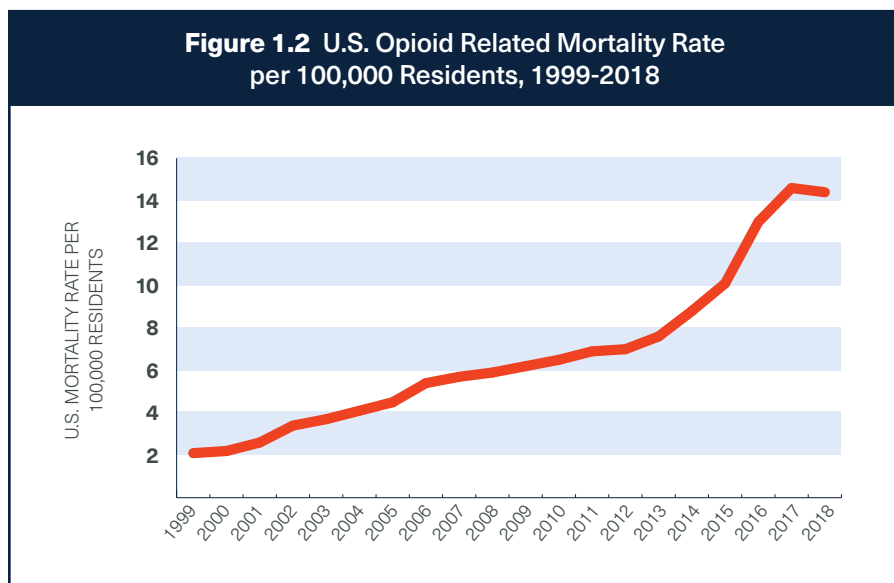
Only 28.9% of individuals with a reported lifetime nonmedical prescription opioid use disorder had sought any type of drug treatment (Saha, 2016). However, this study uses a narrower definition than the one used by SAMSHA, which means that if SAMSHA collected lifetime prevalence data it would likely report higher lifetime prevalence rates. People with a diagnosis of nonmedical prescription opioid use disorder are also significantly more likely to use other nonmedical prescription drugs and alcohol, in addition to having a diagnosis of bipolar I or a personality disorder. Last but not least, people who use nonmedical opioids often experience structural violence and/or criminalization, which in turn can lead to social isolation, poverty, and lifelong trauma, all of which make seeking or obtaining treatment magnitudes more difficult.

Over the past two decades, misuse of prescription opioids among persons 12 years or older has slightly declined, while lifetime and recent use of heroin has slightly increased (SAMSHA, 2019; SAMSHA, 2020). Correspondingly, there has been little change in the percent of persons 12 years or older with a substance use disorder (SUD) related to pain relievers, and a slight increase in those meeting the SUD criteria related to heroin misuse. Despite these modest changes in misuse and SUD, the number of opioid related deaths has increased by almost 7-fold since 2000 from 2.1 per 100,000 to 14.4 per 100,000 in 2018 (CDC WONDER, 2020; see Figure 1.2 above). There are multiple reasons for the increase in mortality, principally it is related to the introduction of fentanyl, its analogs and other adulterants in illegally obtained opioids.

**Table 1.1** Persons Reporting Opioid Misuse in Past Year among Persons Aged 18 or Older, by Age Group and Demographic Characteristics, SAMSHA/NSDUH U.S. National Estimates, 2018\*

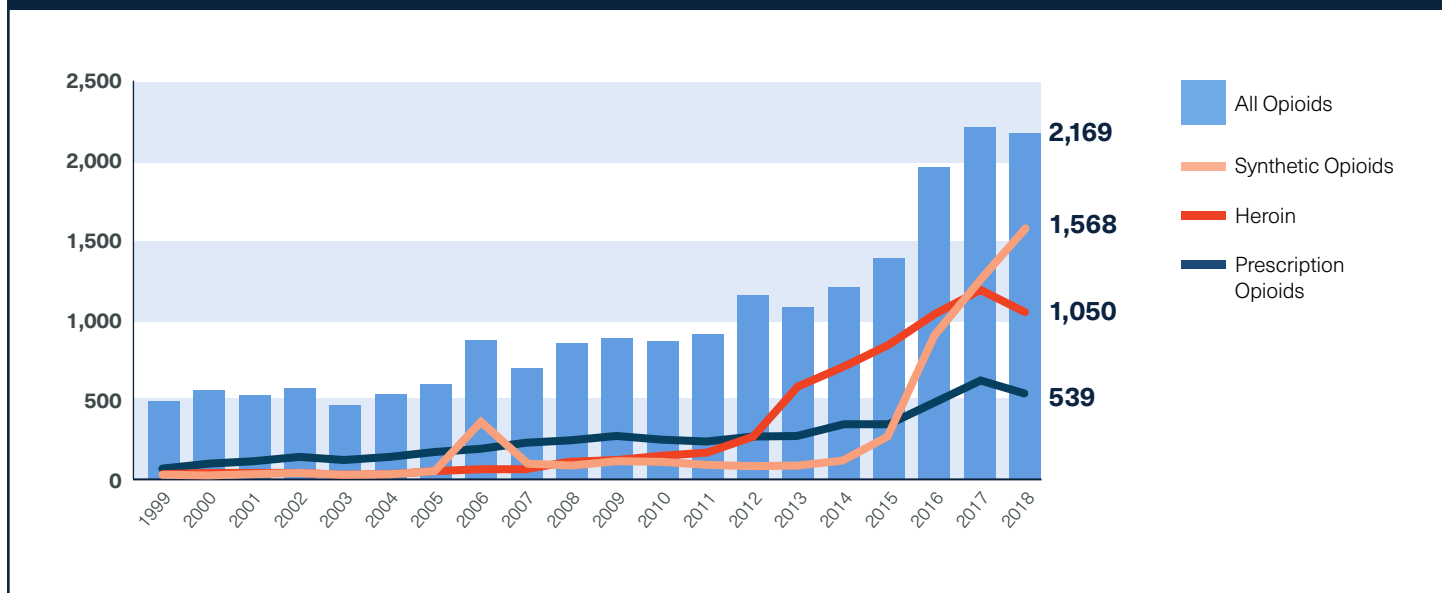
DEMOGRAPHIC CHARACTERISTIC	TOTAL US POPULATION	% PERSONS REPORTING OPIOID MISUSE	RATE PER 100 PERSONS
<b>Gender</b>			
Female	166,950,000	2.69%	2.69
Male	160,400,000	3.15%	3.15
<b>Race/Ethnicity</b>			
African American	43,864,900	2.54%	2.54
Hispanic/Latinx	60,559,750	2.42%	2.42
White non-Hispanic	196,737,350	3.24%	3.25

\*Source: SAMSHA, 2018



In the State of Illinois, there were 6,330 deaths involving opioids identified on death records between 2016-2018 (see Figure 1.3 below; source: <https://www.drugabuse.gov>). Mortality data for the whole State for years 2019 and 2020 were unavailable, but an estimated additional 2000-3000 deaths have occurred in Illinois between January 2019 and June 2020. The rapid increase since 2016 is largely attributable to the increased prevalence of fentanyl and its analogs in opioids obtained in the unregulated market. The statewide mortality rate for opioid related deaths was 17.0 per 100,000 residents (NIDA, 2020). Illinois has the 18th highest mortality rate from opioids in the country (NIDA, 2020). The highest rates were observed in West Virginia (42.4 per 100,000) and Maryland (33.7 per 100,000).

**Figure 1.3 Trend in Opioid Related Deaths in the State of Illinois, 1999-2018**



Source: Drugabuse.gov and CDC WONDER, Available at <https://www.drugabuse.gov/drug-topics/opioids/opioid-summaries-by-state/illinois-opioid-involved-deaths-related-harms>

While most opioids can result in opioid use disorder after continued use, heroin and fentanyl tend to be more addictive, more lethal and lead to greater medical complications such as communicable diseases (Hepatitis, HIV), myocardial infarction, heart failure, immune suppression especially from fentanyl, respiratory disorders associated with sleep, peripheral vein disorders, and organ damage (Baldini, 2012). Heroin is seven times and fentanyl is over 100-times more potent than morphine (WHO, 2018). This translates to a lower effective dose to achieve the same level of euphoria and other opioid related adverse physiologic effects. In addition, research indicates that fentanyl is far more addictive relative to both heroin and morphine (Comer, 2008). Recent research also indicates that the effects of heroin and fentanyl are potentiated by simultaneous use of ethanol (Perez-Mana, 2018), primarily by inhibiting metabolism of the opioids.

SAMSHA data provides further evidence regarding the differences in addictiveness among opioids. Among those reporting heroin misuse, they report using heroin on average 13.6 days per month, compared to 7.0 days per month for prescription opioids (SAMSHA, 2019). This raises an important point. There is a common misconception that most opioid misusers and especially those who meet the criteria for substance use disorder compulsively use opioids every day. In fact, only a small fraction (16.3%) of those reporting use of heroin in the past year indicated they used heroin on a daily basis (SAMSHA, 2019). As with alcohol, a large proportion of those that misuse opioids do not misuse them daily (SAMSHA, 2019). It is important to remember that the category "heroin" in the SAMSHA study includes heroin and any other opioids or adulterants sold as "heroin", including fentanyl.

### Fentanyl is a Key Cause of Mortality

**OPIOID MISUSE WITH FENTANYL**

**OPIOID OVERDOSES WITH FENTANYL**

Despite the fact that an estimated **8%** of persons misusing opioids use heroin and fentanyl analogs, studies show that fentanyl is found in **50-70%** of fatal opioid overdoses.

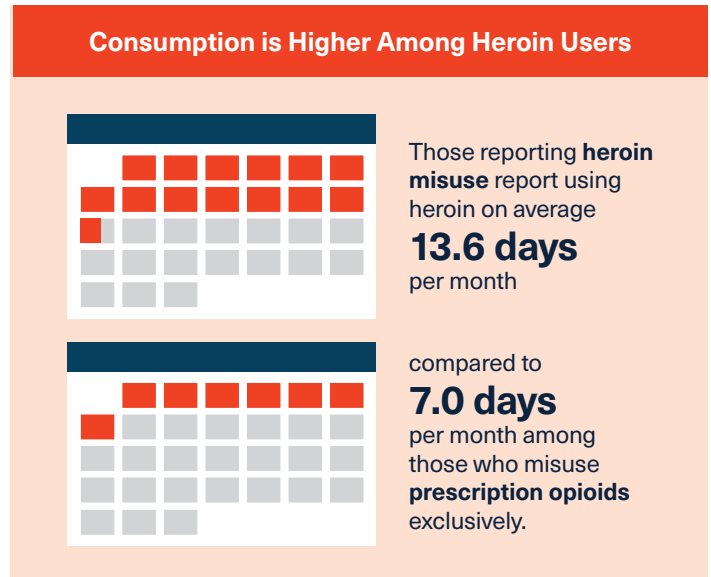
Over the last 10 years in the U.S., a large proportion of heroin in the unregulated market began to contain fentanyl analogs, in addition to non-opioid agents and impurities. This increase in exposure to fentanyl and its analogs is correlated with an increased risk of overdose in those exposed. Despite the fact that an estimated 8% of persons misusing opioids use heroin and fentanyl analogs, studies show that fentanyl is found in 50-70% of fatal opioid overdoses (Spencer, 2019; Serinelli, 2019; Scholl, 2019).

Opioids reach consumers through various avenues. Prescription opioids, which are the primary opioids resulting in opioid use disorder, are obtained predominately through

legal prescriptions usually for post-surgical or chronic pain conditions. These prescriptions are provided directly to the individual misusing opioids or obtained from a friend or family member (SAMSHA, 2019). However, a proportion of prescription opioids that are used in a manner other than directed by a health professional are acquired from third parties that obtain the opioids via theft, counterfeit markets, and illegal networks that obtain the drugs through pharmacies and wholesale distributors (SAMSHA, 2019; DEA, 2019).

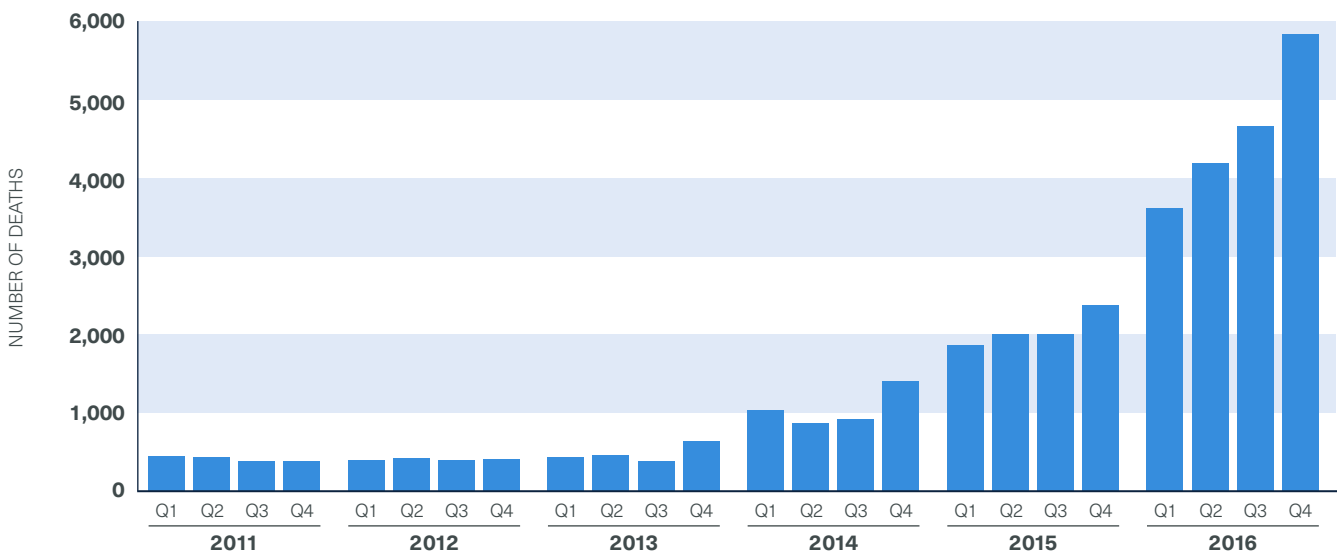
In contrast in the U.S., “heroin” and its constituents/ adulterants are grown or manufactured (e.g. synthetic opioids such as fentanyl) primarily in Latin America and are smuggled across the border using similar tactics for other drugs. United States Department of Justice data shows that in recent years over 90% of heroin seized at the wholesale level in the United States comes from Mexico (USDOJ National Drug Threat Assessment December 2019).

Based on Drug Enforcement Agency (DEA) data, the number of laboratory reports that identified fentanyl in a toxicology screening increased by 60-fold between 2013 and 2017. The DEA data indicates that fentanyl is combined with heroin primarily at the local or regional retail level, not by the wholesalers and manufacturers (DEA, 2019). In 2018, DEA forensic labs reported that 41% of retail heroin seized nationally contained fentanyl, and approximately 65% of “heroin” overdose deaths involved mixtures containing



fentanyl (DEA, 2019). To complicate the problem further, each year more studies are showing that the majority of persons who die from an opioid overdose test positive for multiple agents – multiple opioids, ethanol, and benzodiazepines (Spencer, 2019; Serinelli, 2019). The combination of these agents potentiate respiratory depression and arrest which is the primary cause of death in opioid users (Baldini, 2012; Perez-Mana, 2018; Serinelli, 2019).

**Figure 1.4** Number of Drug Overdose Deaths Involving Fentanyl, by Quarter: United States, 2011 – 2016



NOTES: Drug overdose deaths are identified using *International Classification of Diseases, 10th Revision* underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Deaths may involve other drugs in addition to fentanyl. Caution should be used when comparing numbers across years. The reporting of at least one specific drug or drug class in the literal text, as identified by multiple cause-of-death codes T36–T50.8, improved from 75.0% of drug overdose deaths in 2011 to 85.4% in 2016.  
 SOURCE: NCHS, National Vital Statistics System, Mortality files linked with death certificate literal text.



## SECTION 2 SUMMARY

# Demographic Characteristics of Suburban Cook County Residents Suffering Acute Opioid Exposures-Overdoses

- The mortality rate was almost 3-fold higher among men compared to women (21.7 vs 7.2 per 100,000 residents). This is likely attributable to the lower use of illegal opioids among female residents in suburban Cook County.
- 35% of both women and men admitted to the hospital had a diagnosis for a serious condition associated with chronic pain – cancer, rheumatoid arthritis, and neurologic disorders.
- **Trends in four different age groups:**
  - **Children under the age of 15 years:** The data indicates that most of these cases involved unintentional exposures to prescription opioids found in the home, medical errors occurring during the course of managing a child's pain, or suspected suicide attempt.
  - **Youth ages 15-19 years:** Most of these exposures were intentional involving misuse of opioids or self-harm cases. This age group is also primarily exposed to prescription opioids - hydrocodone and oxycodone.
  - **Adults 20-64 years:** The highest mortality rates were observed in this age group and they had the highest proportion of reported heroin use and concurrent use of sedative-hypnotics, ethanol and stimulants. As this age group gets older, we observed an increase in prescription opioids correlated with the increase in serious comorbid conditions associated with chronic pain.
  - **Older adults 65 years and older:** This age group is predominately misusing prescription opioids and a large proportion suffer from conditions associated with chronic pain - cancer, rheumatoid arthritis and neurologic conditions.
- The average annual rates for inpatient admissions and medical examiner deaths were nearly equivalent for Black/African-American and white non-Hispanic suburban Cook County Residents, but the rates were substantially lower among Hispanic/Latinx residents. The average annual mortality rates per 100,000 based on the medical examiner data were as follows: Black/African-American, 18.5; Hispanic/Latinx, 6.9; white non-Hispanic, 18.2.
- From 2016 through 2019, the total hospital charges to treat suburban Cook County residents for acute opioid exposures-overdoses was \$506.2 million USD.
- A total of \$20.3 million in charges were incurred for the care of individuals without medical insurance coverage. The total charges to care for individuals with Medicaid coverage was \$121.9 million USD and to cover those with Medicare coverage was \$201.9 million USD in hospital charges.

## SECTION 2

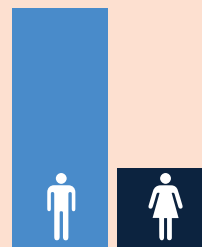
# Demographic Characteristics of Suburban Cook County Residents Suffering Acute Opioid Exposures-Overdoses

### 2.1 Gender

The majority of cases (both non-fatal and fatal) in the poison center and inpatient data were women, with the pattern being reversed in the outpatient ED and medical examiner data. This can be explained, in part, by gender differences in mechanisms used for suicide attempts, type of opioids used, relative lethality of prescription opioids compared to opioids in the illegal drug supply market, and health care utilization patterns (see Figure 2.1 below).

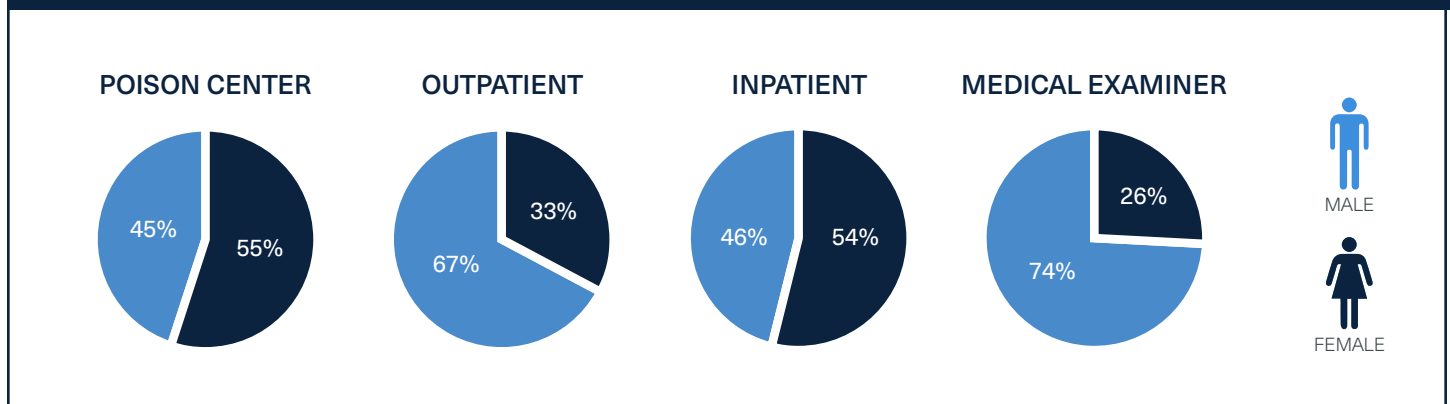
The average annual rates in each data system are presented in Table 2.1 below.

#### Mortality Rate is Substantially Higher Among Males



The mortality rate was almost **3-fold higher** among men compared to women (21.7 vs 7.2 per 100,000 residents). This is likely attributable to the lower use of opioids obtained in the illegal drug supply market among female Cook County residents.

**Figure 2.1** Gender of Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020

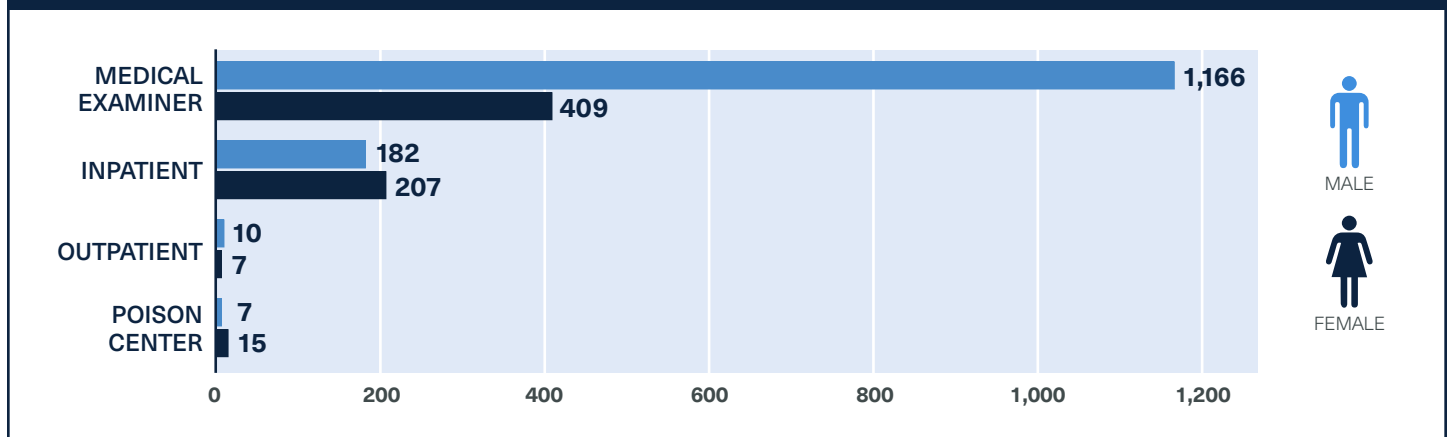


**Table 2.1:** Average Annual Call, Hospitalization and Mortality Rates per 100,000 residents by Gender Among Suburban Cook County Residents Experiencing Acute Opioid Exposures-Overdoses, 2016 to June 2020

GENDER	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
Female	18.2	40.4	76.6	7.2
Male	15.7	85.7	67.8	21.7

\*Denominator for the calculation of rates used the 2019 ACS population estimates, U.S. Census Bureau

**Figure 2.2 Number of Deaths among Females and Males as Reported in Each Data System**



While suicide ideation and planning is nearly equivalent between genders (SAMSHA, 2019), research has shown that women are more likely than men to attempt suicide using poisons (Ajdacic-Gross, 2008). In contrast, men are more likely to use more lethal means such as firearms and hanging. The greater proportion of women in the Illinois Poison Center data corresponds with a greater proportion of reported suicide attempts in this database; 50.9% of calls (n=957) were reported to involve a suicide attempt, of which 61.8% involved females (n=591). In the other datasets, suicide was reported as a reason for drug overdose in 0.2% to 3.4% of cases.

**In addition, 35% of both women and men admitted to the hospital had a diagnosis for a serious condition associated with chronic pain – cancer, rheumatoid arthritis, and neurologic disorders.**

Among suburban Cook County residents, female inpatient cases were disproportionately over the age of 75 years (8.7% vs 4.7%) and were more likely to require orthopedic procedures involving the spine, hip and knee during the course of hospitalization. This partly corresponds with the greater proportion of females suffering fall injuries while intoxicated with opioids (9.7% females vs 6.6% males). Research has demonstrated that individuals using opioids chronically, especially among the elderly, have an increased risk of fractures, predominately from an increased risk of falls as a result of impaired mobility and balance (Vestergaard, 2006). Based on national data (SAMSHA, 2019), the majority of women

with opioid use disorders misuse prescription opioids in a manner other than as directed by a health professional, as opposed to using heroin or other illegal drugs. In 2018, 5.9% of women used heroin in 2018 compared to 10.2% of men. It is important to keep in mind that the majority of heroin users also misuse prescription opioids. Out of the 4.9 million women with opioid use disorders nationally, 97.9% misused prescription pain relievers; 50% of which involved hydrocodone and 29.2% oxycodone.

This difference in source of opioids is reflected in the Cook County data as well. In the medical examiner data, women compared to men were slightly less likely to test positive for fentanyl and its analogs (55.8% vs 65.5%) or heroin (50.4% vs 57%), but were far more likely to test positive for pharmaceutical manufactured opioids (35.7% vs 21.7%). Similarly in the inpatient data, women were three times less likely to report addiction to heroin (the only ICD-10 category for illegally obtained non-prescription opioids) than men (7.4% females vs 22.4% males). This, in part, explains the differences in the proportion of females to males who died.

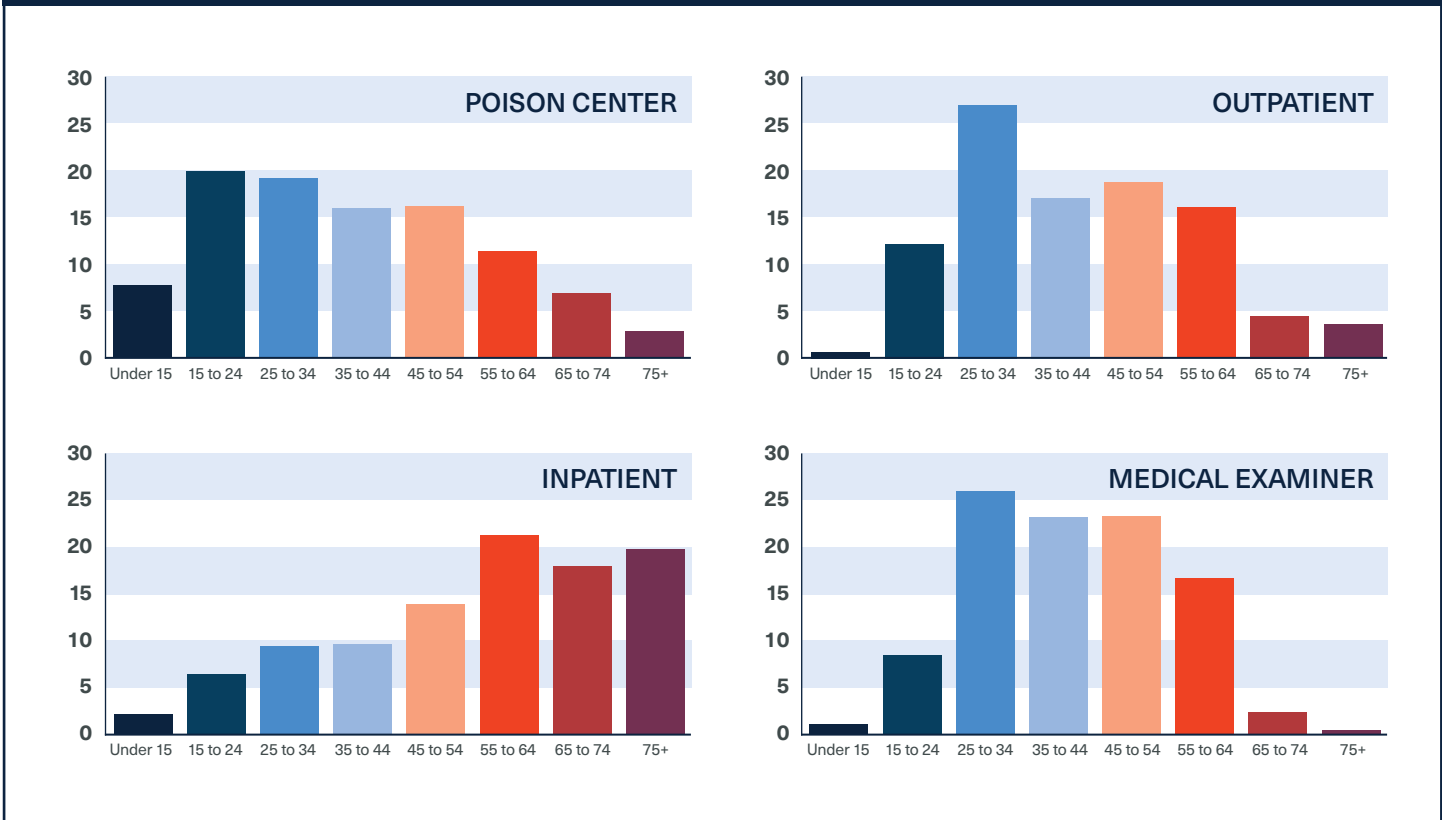
## 2.2 Age

The age distribution is provided in the figures on the next page (See Figures 2.3: *Percent Distribution by Age Group of Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020*). The mean age of cases in each dataset is as follows: poison center, 38.1 years; outpatient, 42.2 years; inpatient, 56.2 years; and medical examiner, 41.6 years. There were 269 cases across the datasets that involved acute exposures to children under the age of 10 years. The largest proportion of persons 65 years and older were treated as inpatients.

The average annual rates per 100,000 residents are substantially higher among the 18 to 64 year group in all of the datasets, with the exception of the inpatient hospital data, which reflects differences in the type of opioids each age group is exposed to (see discussion below and Table 2.2).



**Figures 2.3: Percent Distribution by Age of Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020**



**Table 2.2: Average Annual Call, Hospitalization and Mortality Rates per 100,000 residents by Age Group Among Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020\***

AGE GROUP	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
Under 18	13.3	8.1	26.8	1.4
18 to 64	20.9	93.5	65.9	23.0
65 and older	8.9	27.5	146.9	2.1

\*2019 ACS population estimates, U.S. Census Bureau

When analyzing patterns by age groups in the poison center and hospital data, five distinct age groups involving opioid exposures-overdoses become apparent:

- Children under the age of 15 years:** Most of these exposures are unintentional. Based on hospital data, the youngest children are predominately exposed to prescription opioids including methadone and unspecified opioids. In the Illinois Poison Center data, hydrocodone, tramadol and codeine are of the most commonly reported opioids in this age group. This indicates several common pathways of exposures observed in childhood poisoning cases: (1) unintentional exposure to an adult's opioid replacement medication found in the home, (2)

unintentional exposures to other prescription opioids found in the home, (3) medical errors during the course of managing a child's pain (11.0% in IPC data), (4) suspected suicide attempt (15.8% in IPC data), and (5) the least common pathway involving intentional opioid use (8.9% in IPC data). ICD-10 codes in the hospital data do not distinguish between misuse of opioids and therapeutic errors, therefore a similar comparison of intent using hospital data is not feasible.

- Youth ages 15-19 years:** Most of these exposures are intentional involving misuse of opioids or self-harm cases. This age group is also primarily exposed to prescription opioids. In the poison center data, hydrocodone and

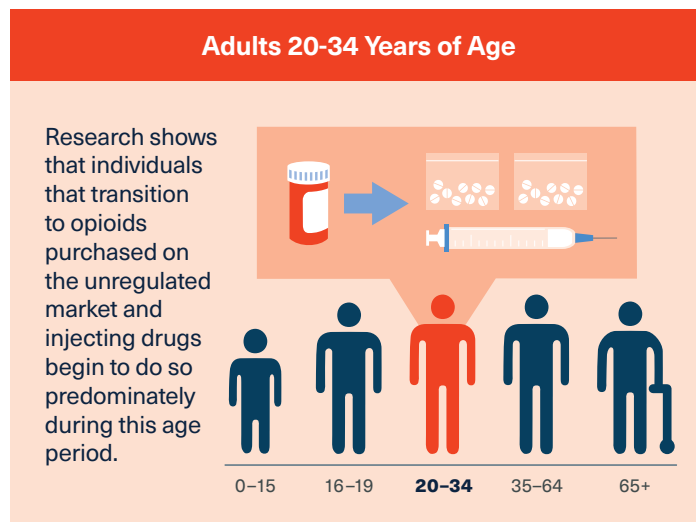
oxycodone were the most common intentional exposures to opioids. While almost 50% of outpatient ED cases in this age group reported using heroin, only 12.9% reported using heroin among the inpatient cases. Similar to their younger counterparts, research shows that most of the opioids in this age group are obtained from the home or peers (SAMSHA, 2019).

- Adults 20-34 years old:** This groups had the highest proportion of reported heroin use: 80% of outpatient ED and 40% of inpatient cases. This age group also had the highest proportion of concurrent use of sedative hypnotics. This provides evidence of a shift beginning in the late teens and early twenties to the use of opioids obtained in the illegal drug supply market. This can reflect an evolving addiction and changes in access to opioids. Research shows that drug misuse and route of administration evolves over time. Most research indicates that users transition to injecting within 1-4 years on average from the period of initiating use. This typically occurs when an individual is in their early 20s (Neaigus, 1997; Young, 2012; Guarino, 2018). However, there is a lot of regional variability with some users actually initiating use of opioids through injections (Strang, 1997).

- Adults 35-64 years:** The proportion of reported prescription opioids begins to increase again in this group, but reported exposure to heroin or fentanyl remains high: 12% of poison center calls, 60% of outpatient ED and 15% of inpatient cases. The increase in prescription opioids correlates with the increase in serious comorbid conditions, including conditions associated with chronic pain.

- Older adults 65 years and older:** This age group is predominately misusing prescription opioids. Compared to younger age groups, only 40.9% outpatient ED and less than 2% of inpatient cases reported use of heroin. In the poison center data, which captures detailed information on specific agents, the most common prescription drugs reported are hydrocodone (55%), tramadol (24%) and oxycodone (7%).

In contrast, when restricting the analysis to the medical examiner data, two-thirds of opioid overdose deaths involved fentanyl among those between the ages of 25 to 74 years. In this age group, almost 25% also tested positive for ethanol, 35.8% tested positive for stimulants, and 20.6% tested positive for sedative-hypnotics. Among 15 to 19 year olds, two-thirds involved heroin and 52% involved fentanyl; very few tested positive for ethanol, stimulants or sedative-hypnotics. In the oldest group (75 years and older), 85% of the fatalities involved

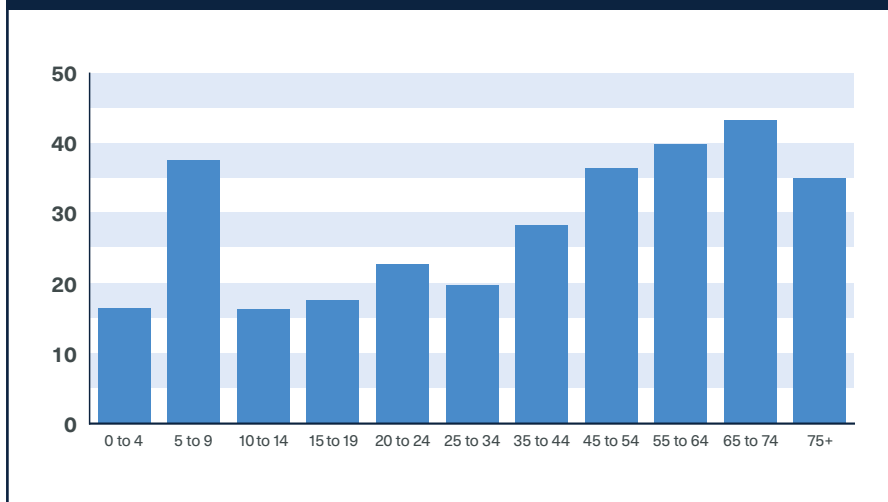


prescription opioids, but there were only six cases and they all tested positive for hydrocodone.

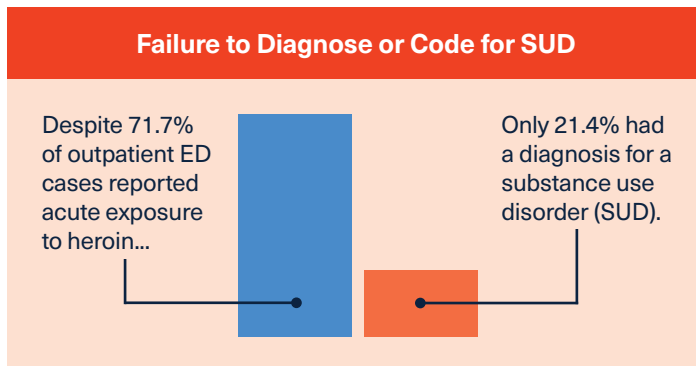
Many of the patients admitted for acute opioid exposure-overdose had a diagnosis for a serious comorbid condition, including conditions associated with chronic pain (see Figure 2.4 below).

Persons under 20 years of age had an average of 1.5 serious comorbid conditions, with depression as the most common diagnosis. The mean number of comorbid conditions increased to over four per individual among those over 55 years of age. There was a large proportion of young children, especially between the ages of 5 to 9 years, with conditions associated with chronic pain. It is likely these children, like their adult counterparts, are being treated with opioids to manage the pain, and admissions likely involve complications following errors

**Figure 2.4** Percent of Inpatient Cases with a Comorbid Diagnosis Associated with Chronic Pain – Cancer, Rheumatoid Arthritis and Neurologic Conditions among Suburban Cook County Residents Admitted for Acute Opioid Exposure-Overdose.







in drug administration. The proportion of admitted patients for acute opioid exposure-overdose with a diagnosis associated with chronic pain increases with age, peaking at 43.3% among the 65-74 year group. A similar pattern was observed among the outpatient ED cases, with 15.4% of those over the age of 75 years with diagnoses associated with chronic pain.

Despite 71.7% of outpatient ED cases reported acute exposure to heroin, only 21.4% had a diagnosis for a substance use disorder. This indicates that medical providers in the hospital setting may fail to either assess for the presence of substance use disorders or code for it in the medical records. A failure to screen for substance use disorders and refer patients to drug treatment programs in the ED has been reported previously (SAMSHA, 2013), as well as an unwillingness by the majority of ED physicians to prescribe self-administered naloxone to persons reporting opioid misuse (Beletsky, 2007).

In the medical examiner data, only one death had a condition associated with chronic pain on autopsy. This corresponds

with the greater proportion of individuals using illegal opioids rather than prescription opioids. In fact, in the medical examiner data, only 7% of the deaths had a major comorbid condition identified through autopsy. The most common comorbid conditions identified were arteriosclerotic and valvular diseases (80), obesity (23), infection (12), diabetes (11), COPD (11), and cirrhosis (8). This may indicate under-reporting of comorbid conditions by the forensic pathologist on drug overdose related deaths.

### 2.3 Race/Ethnicity

The largest proportion of acute opioid exposure-overdose cases involving suburban Cook County residents were white non-Hispanic residents, followed by Black/African-American residents (see Table 2.3 below). However, after adjusting for overall population, the average annual rates for inpatient admissions and medical examiner deaths were nearly equivalent for Black/African-American and white non-Hispanic suburban Cook County residents.

The table on the next page presents the crude average annual call, hospitalization and mortality rates (see Table 2.4: *Average Annual Call, Hospitalization and Mortality Rates per 100,000 residents by Race/Ethnicity Among Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020*). The overdose death rates by race/ethnicity based on the medical examiner data in suburban Cook County were comparable to those reported nationally, with the exception of the rate among Black/African-American residents which has been increasing in recent years. The 2018 national rates per 100,000 were as follows: Black/African-American, 14.0; Hispanic/Latinx, 7.5; white non-Hispanic, 18.6 (Wilson, 2020).

**Table 2.3:** Race/Ethnicity of Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020

RACE/ETHNICITY	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
American Indian or Alaska Native	n/a	6 (0.1%)	4 (0.1%)	0 (0.0%)
Asian	n/a	48 (0.8%)	132 (1.9%)	12 (0.8%)
Black or African American	n/a	1610 (26.2%)	1536 (21.6%)	345 (21.9%)
Hispanic/Latinx	n/a	665 (10.8%)	638 (9.0%)	167 (10.6%)
Native Hawaiian or Pacific Islander	n/a	126 (2.1%)	35 (0.5%)	0 (0.0%)
Other Race	n/a	529 (8.6%)	335 (4.7%)	0 (0.0%)
Unspecified	n/a	62 (1.0%)	104 (1.5%)	6 (0.4%)
White Non-Hispanic	n/a	3089 (50.4%)	4319 (60.8%)	1046 (66.4%)

**Table 2.4:** Average Annual Call, Hospitalization and Mortality Rates per 100,000 residents by Race/Ethnicity Among Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020\*

RACE/ETHNICITY	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT)	COOK COUNTY MEDICAL EXAMINER
American Indian or Alaska Native	n/a	5.4	3.6	0.0
Asian	n/a	5.1	14.1	1.1
Black or African American	n/a	97.0	92.6	18.5
Hispanic/Latinx	n/a	30.9	29.7	6.9
White Non-Hispanic	n/a	60.4	84.4	18.2

\*2019 ACS population estimates, U.S. Census Bureau

### Hispanic/Latinx Residents

A key finding was that the hospitalization and mortality rates were substantially lower among Hispanic/Latinx residents. National data shows that the rate of opioid misuse is nearly equivalent between Black/African-Americans and Hispanic/Latinx, with the overall rate about 30% higher in white non-Hispanics (SAMSHA, 2019), but misuse does not directly translate to overdose incidence. The discrepancy between national estimates of misuse of opioids and hospital and Medical Examiner data on intoxication-overdoses in relation to Hispanic/Latinx residents, can be potentially attributed to several factors:

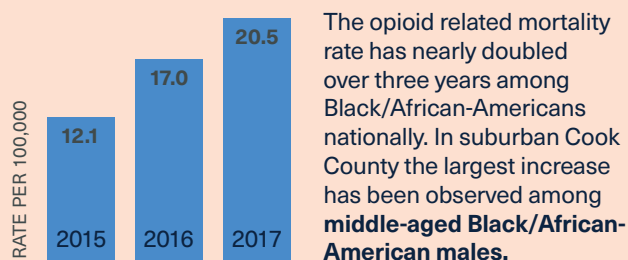
- Regional variability attributed to lower misuse of opioids among Hispanic/Latinx residents of suburban Cook County. This could explain the lower hospitalization and Medical Examiner rates.
- Misuse of less lethal opioids by Hispanic/Latinx residents. In other words, lower misuse of opioids purchased in the unregulated market. This could explain the difference in Medical Examiner rates. However, the hospital data shows that Hispanic/Latinx patients reported a similar proportion of misuse of heroin in the outpatient ED (67.7%) and inpatient cases (13.6%) as both their Black/African-American and white, non-Hispanic counterparts. In addition, the Medical Examiner data indicates that a greater proportion of Hispanic/Latinx residents test positive for fentanyl and its analogs than both Black/African-Americans and white, non-Hispanics. The evidence does not fully support the hypothesis of a lower use of less lethal opioids.
- Lower likelihood to seek treatment in a hospital setting for opioid misuse, which is consistent with national data showing that Hispanic/Latinx residents are about half as likely to seek drug treatment as both their Black/African-American and white non-Hispanic counterparts. This could partially explain the difference in hospitalization rates.

- Misclassification of ethnicity by the hospital staff and pathologists at the Medical Examiner’s office could result in an undercount of affected Hispanic/Latinx residents. However, there is no method to evaluate misclassification in these secondary datasets without re-abstraction of the records.

### Black/African-American Residents

The hospital and Medical Examiner data indicate similar inpatient hospitalization and death rates between Black/African-American and white non-Hispanic residents of Cook County. Data for Cook County reflects changing patterns nationwide. Over the past 20 years the mortality rate from drug poisoning has precipitously increased among white non-Hispanics in the U.S., but among Black/African-Americans the rate held relatively stable until 2015 (CDC, 2019). A marked increase in the rate among Black/African-Americans occurred in 2016, even though it began to slightly increase beginning in 2014 (CDC, 2019). In 2016, the rate jumped nationally from 12.1 per 100,000 to 17.0 and then to 20.5 in 2017 – almost doubling over three years (CDC, 2019). Data shows that a similar dramatic increase was observed specifically for death involving synthetic opioids other than methadone (i.e. fentanyl; AHRQ, 2020). This corresponds, to a large degree, with DEA data showing the exponential increase in the availability of fentanyl and its analogs in the U.S. drug market beginning between 2013-2015.

### Opioid Death Rates are Rising Among African-Americans

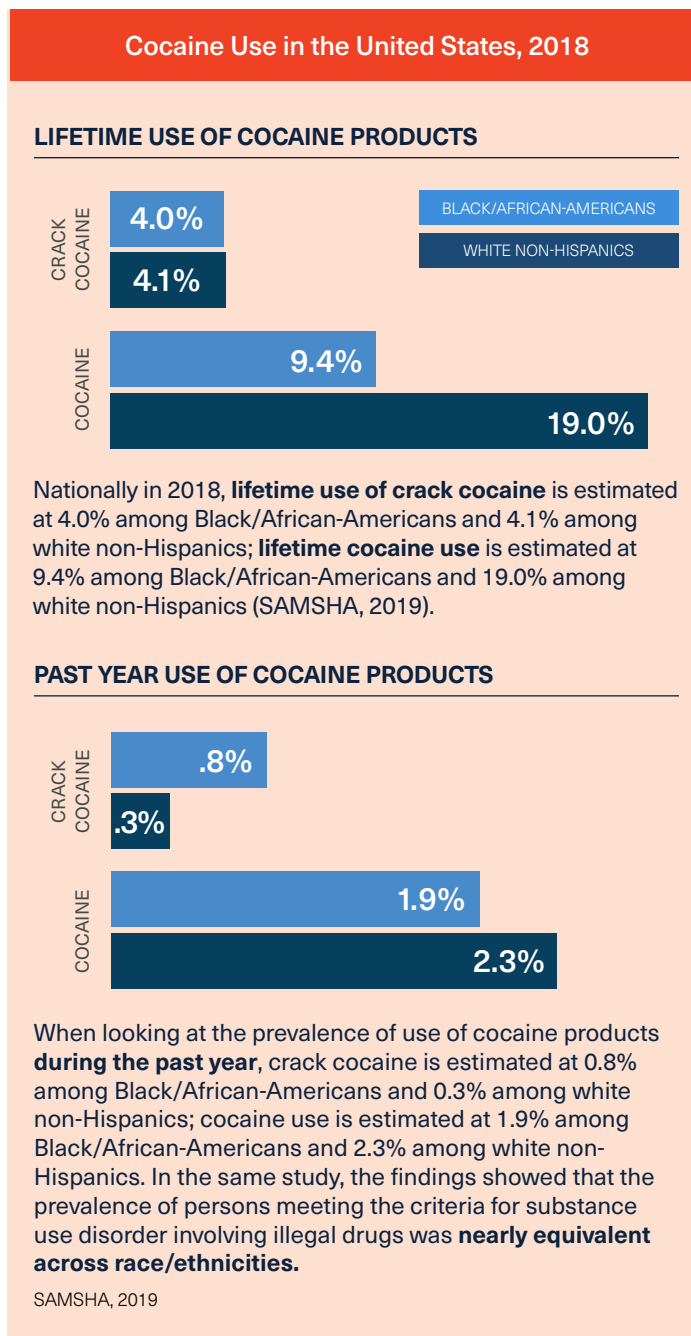


There is also a strong correlation between substance use and other mental health disorders, as well as suicide ideation and suicide attempts. The prevalence of major depressive episodes has increased since 2015 among Black/African-Americans nationwide, with almost a 50% increase among 18-25 year olds (SAMSHA, 2018). This also corresponds with a marked increase in suicidal thoughts and planning (SAMSHA, 2018). While the rate of suicide has been steadily increasing nationally among white non-Hispanics between 1999-2018 (increasing from 12.0 to 18.0 per 100k), the suicide rate was relatively stable among Black/African-Americans until 2015. However between 2016-2018, the rate has increased by 20% nationally among Black/African-Americans (5.8 to 7.2 per 100k).

This coincides with a long-term problem in the United States. National data demonstrate that Black/African-Americans have fewer options and more barriers to accessing mental health providers including treatment for substance use disorders (Longshore, 1992; Wells, 2001; Cummings, 2013; Cummings, 2016; Cummings, 2017). Black/African-Americans are also less likely to receive adequate assessment and treatment for mental health issues (Cooper, 2006; Le Cook, 2011; ), are less likely to receive prescriptions for psychiatric medications (Cooper, 2006; Hall, 2010; Cook, 2017; Carson, 2017; Ji, 2018, Cummings, 2019), and express greater unfavorable views about the medical system and drug treatment programs than their white non-Hispanic counterparts (Longshore, 1992; Cooper, 2006). Furthermore, among those with substance use disorders, Black/African-Americans are less likely to receive treatment despite being more likely to recognize their need for treatment and seek care (Lipari, 2013). Research indicates that the willingness to seek care is present, but systemic barriers limit access to needed services.

There are assertions in the literature that an additional explanation for the recent sharp increase in opioid related deaths among Black/African-Americans is through the use of cocaine products containing fentanyl (James, 2018). As a result of a common misconception that cocaine use is more common among Black/African-Americans (see call out box below), there have been public health investigators who have hypothesized that the recent increase in opioid related deaths among Black/African-Americans may be attributed predominately to contaminated cocaine products.

Since the publicly available medical examiner data does not provide dose estimates for the agents they identify on the toxicological screening, it is difficult to ascertain which drug the individual believed they were using, as opposed to inadvertently using. When looking at all persons testing positive for cocaine in the Medical Examiner data, the proportion also testing positive for fentanyl was equivalent across race/ethnicities: Black/AA, 46.0%; Hispanic/Latinx, 45.0%; white non-Hispanic, 47.9%. In the same group testing positive for cocaine, the proportion also testing positive for



any opioid was higher among white non-Hispanics: Black/AA, 63.4%; Hispanic/Latinx, 63.8%; white non-Hispanic, 76.2%. The difference involving prescription opioids can be partly explained by the lower likelihood a Black/African-American patient will be prescribed opioids for the management of pain, even among children (Pletcher, 2008; Singhal, 2016; Groenwald, 2018).

The evidence does not support the role of differential exposure to contaminated cocaine products with fentanyl and its analogs in suburban Cook County. Furthermore, while the evidence does demonstrate concurrent exposure to cocaine and opioids in Cook County residents, it is

not possible to differentiate whether the exposures are inadvertent or intentional. While there is evidence that cocaine has been adulterated with fentanyl, it is also common practice among drug users to mix stimulants with opioids to counteract the lethargy caused by opioids; the opposite is true too, in that it is not uncommon for stimulant users to mix their drug of choice with opioids and sedative-hypnotics to counteract the anxiety and agitation experienced while on prolonged use of stimulants.

### White non-Hispanic Residents

Coinciding with national data, white non-Hispanic residents of suburban Cook County are one of the high risk groups identified in this analysis. The rate of inpatient admissions and deaths based on Medical Examiner data were highest among white non-Hispanic residents of Cook County, as with their fellow Black/African-American counterparts. In the inpatient hospital data, white non-Hispanics were slightly more likely to report intoxication-overdose from prescription opioids: 86.0%, white non-Hispanics; 85.1% Hispanic/Latinx; and 77.7% Black/African-American. There were similar differences in the outpatient ED data as well.

However, in the Medical Examiner death data, white non-Hispanics were less likely to test positive for fentanyl or its analogs: 58.9%, white non-Hispanics; 71.3% Hispanic/Latinx; and 71.3% Black/African-American. Correspondingly, white non-Hispanics were more likely to test positive for prescription opioids: 29.2%, white non-Hispanics; 16.2% Hispanic/Latinx; and 18.3% Black/African-American. This is despite the fact the proportion with comorbidities associated with chronic pain and average number of serious

comorbidities was nearly identical across all three ethnic groups in the hospital data.

## 2.4 Medical Service Payor and Cumulative Hospital Charges

The total hospital charges to treat Suburban Cook County residents for acute opioid exposures-overdoses between 2016-2019 was \$506.2 million USD (outpatient ED total, \$29,002,429; inpatient total, \$477,223,059). This does not include the cost to treat persons seeking care for substance use who did not have an acute opioid exposure-overdose at time of hospital treatment. (\*Note about hospital charges: hospital charges do not reflect the true cost to treat a patient in the hospital setting. In addition, they do not reflect comprehensive costs which include lost productivity, ancillary medical fees, insurance costs, etc.) A disproportionate amount of the financial payments for the treatment of acute opioid exposure-overdose falls on government insurance programs (Medicaid and Medicare) or on the hospitals and individuals because the patient lacks health care insurance coverage (see Table 2.5 below).

A total of \$20.3 million in charges were incurred for the care of individuals without medical insurance coverage. The total charges to care for individuals with Medicaid coverage was \$121.9 million USD and to cover those with Medicare coverage was \$201.9 million USD in hospital charges. Among the inpatient cases, almost half were covered by Medicare, which corresponds to the overall distribution of payor type for all inpatient admissions statewide for any medical reason (not restricted to opioid related cases).

**Table 2.5:** Payor Type and Cumulative Hospital Charges to Care for Suburban Cook County Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to 2019

PRIMARY PAYOR CATEGORY	OUTPATIENT ED VISITS FOR ACUTE OPIOID EXPOSURE-OVERDOSE (N=6135)	ALL OUTPATIENT ED VISITS STATEWIDE	INPATIENT ADMISSIONS FOR ACUTE OPIOID EXPOSURE-OVERDOSE (N=7103)	ALL INPATIENT ADMISSIONS STATEWIDE
Self Pay / Uninsured	941 (15.3%)	4.7%	249 (3.5%)	3.6%
Charity	125 (2.0%)	0.8%	41 (0.6%)	0.5%
Medicaid	2863 (46.7%)	22.4%	1551 (21.8%)	22.2%
Medicare	786 (12.8%)	28.4%	3173 (44.7%)	41.2%
Private Insurance	1305 (21.3%)	39.7%	1985 (27.9%)	30.2%
ChampUS <sup>a</sup> or ChampVA <sup>b</sup>	6 (0.1%)	0.5%	16 (0.2%)	0.4%
Workers' Compensation	6 (0.1%)	0.8%	23 (0.3%)	0.2%
Other/Unspecified	103 (1.7%)	2.7%	65 (0.9%)	1.7%

<sup>a</sup>ChampUS which is currently referred to as Tricare, is a federal health insurance program that covers military personnel and their beneficiaries under the Department of Defense.

<sup>b</sup>ChampVA is a federal health insurance program that covers military veterans under the Department of Veterans Affairs.



However, among the outpatient ED cases, compared to the overall distribution of payor type for all outpatient ED hospital visits statewide for any medical reason (not restricted to opioid related cases), there were almost twice the proportion with a Medicaid payor and three times as many uninsured. Research has shown that uninsured individuals are more likely to be treated in the ED rather than admitted to a hospital (Venkatesh, 2019), but our data indicate that it may be more pronounced for those seeking care for acute opioid exposure-overdose. This is important because cases who are admitted as inpatients are more likely to receive more intense drug screening. Research has demonstrated a failure to screen for substance use disorders and refer patients to drug treatment programs in the outpatient ED setting (SAMSHA, 2013), as well as an unwillingness by the majority of ED physicians to prescribe self-administered naloxone to persons reporting opioid misuse (Beletsky, 2007). To compound the problem, persons without health insurance have fewer options for drug treatment (Cummings, 2014).

It is unlikely that those without insurance or on Medicaid are simply more likely to use the outpatient ED hospital setting to obtain drugs, at least among those being treated for opioid intoxication-overdose. Nearly all of the patients – 92.0% on Medicaid and 91.8% of self-insured – came to the hospital complaining of drug poisoning and related symptoms. This is substantially higher than those on Medicare (74.1%) or private insurance (78.8%).

### Cost to Treat Opioid Intoxication-Overdose



From 2016 through 2019, the **total hospital charges** to treat Suburban Cook County residents for acute opioid exposures-overdoses was \$506.2 million USD.

Insurance coverage alone does not appear to be the only factor to impact drug treatment services in the hospital setting. There is evidence that State policies, not only the type of insurance coverage, can impact access to care for drug treatment. States that have implemented naloxone standing orders that allow non-physicians to distribute naloxone, have “Good Samaritan” laws that protect individuals from criminal prosecution who call emergency services for drug overdoses, and have expanded medication-assistance treatment (MAT) programs in turn have higher hospital utilization rates for opioid misuse and overdoses. In addition, patients in these States are more likely to receive drug treatment services during their hospitalization (Blanchard, 2018).



## SECTION 3 SUMMARY

# Temporal Patterns of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

- Despite anecdotal reports of increases in overdoses around the winter holidays, there was no consistent seasonal pattern across the different data systems. While outpatient ED visits increased modestly during the summer for acute opioid exposures, poison center calls and deaths in the medical examiner data appeared to slightly increase in the winter and early spring.
- A similar discrepancy is seen when looking at patterns by day of the week. While admissions were highest during the work week, both outpatient ED visits and medical examiner data were higher on Fridays through Sundays. The latter is likely associated with increased use of intoxicating agents on weekends, including alcohol.
- The medical examiner data, which provides some of the most critical information on opioid overdoses, did not show any significant change in overall death rates between 2016 and 2020. There was an overall *insignificant* increase in trend of overdose deaths by +0.3% per month (CI95%: -0.1%, 0.7%; p=0.101).
- Some regions in the country have reported an increase in opioid related overdoses during the COVID-19 quarantine period. However, in Cook County, the trend began to increase back in November 2019, which is three to four months prior the stay at home order issued by the Governor of Illinois. In fact, December 2019 had the highest number of deaths out of any month during the period of follow-up. However, the Cook County Medical Examiner's Office anticipates that the opioid overdose numbers for 2020 will be higher once they are able to complete all the related autopsies.
- There was a significant increase in outpatient ED visits among Black/African-Americans, with no change in hospital admissions. However, mortality data showed a steady significant increase over the entire period. This has primarily impacted Black/African-American middle aged (35-64 yrs) men. This coincides with national data showing a pronounced increase in opioid poisoning beginning in 2016 among Black/African-Americans.
- In contrast, white non-Hispanic middle aged (35-64 yrs) women have shown a decline in admissions, a plateauing in outpatient ED visits towards the end of 2017, and no change in deaths. This indicates that there may be a plateauing or decline in incidence within this subgroup which may be attributable to changes in prescription patterns. Nationally, this has been a high risk subgroup.

## SECTION 3

# Temporal Patterns of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

## 3.1 Seasonal and Weekday Patterns

There was no consistent seasonal pattern across the different data systems. While outpatient ED visits increased modestly during the summer for acute opioid exposures, Illinois Poison Center calls and deaths in the medical examiner data appeared to slightly increase in the winter and early spring (see Table 3.1 below). A similar discrepancy

is seen when looking at patterns by day of the week. While admissions were highest during the work week, both outpatient ED visits and medical examiner data were higher on Fridays through Sundays. The latter is likely associated with increased use of intoxicating agents on weekends, including alcohol (Finlay, 2012; Knowlton, 2013).

**Table 3.1:** Seasonal and Weekday Patterns of Acute Opioid Exposure-Overdose Among Suburban Cook County Residents, 2016 to June 2020

	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
<b>Month</b>				
January	206 (11.0%)	443 (7.2%)	589 (8.3%)	139 (8.8%)
February	195 (10.4%)	473 (7.7%)	605 (8.5%)	138 (8.8%)
March	149 (7.9%)	488 (8.0%)	590 (8.3%)	153 (9.7%)
April	159 (8.5%)	443 (7.2%)	579 (8.2%)	146 (9.3%)
May	190 (10.1%)	540 (8.8%)	602 (8.5%)	141 (8.9%)
June	138 (7.3%)	516 (8.4%)	565 (8.0%)	106 (6.7%)
July	133 (7.1%)	539 (8.8%)	614 (8.6%)	110 (7.0%)
August	147 (7.8%)	556 (9.1%)	604 (8.5%)	111 (7.0%)
September	148 (7.9%)	580 (9.5%)	568 (8.0%)	126 (8.0%)
October	135 (7.2%)	547 (8.9%)	638 (9.0%)	118 (7.5%)
November	139 (7.4%)	501 (8.2%)	580 (8.2%)	138 (8.8%)
December	140 (7.5%)	509 (8.3%)	569 (8.0%)	150 (9.5%)
<b>Weekday</b>				
Sunday	255 (13.6%)	828 (13.5%)	831 (11.7%)	267 (16.9%)
Monday	267 (14.2%)	836 (13.6%)	1165 (16.4%)	222 (14.1%)
Tuesday	284 (15.1%)	802 (13.1%)	1153 (16.2%)	207 (13.1%)
Wednesday	271 (14.4%)	894 (14.6%)	1161 (16.3%)	190 (12.1%)
Thursday	276 (14.7%)	899 (14.7%)	1086 (15.3%)	197 (12.5%)
Friday	260 (13.8%)	955 (15.6%)	963 (13.6%)	247 (15.7%)
Saturday	266 (14.2%)	921 (15.0%)	744 (10.5%)	246 (15.6%)

### 3.2 Temporal Patterns Based on Poison Center Data

When looking at monthly trend data for rates of calls, hospital visits, and deaths, we continue to see that each data system provides a different picture. The poison center data, which predominately involves suicide attempts, shows a significant decline in the overall trend by -1.0% per month (CI95%:-1.3%, -0.7%;  $p<0.001$ ; see Figure 3.1 at right).

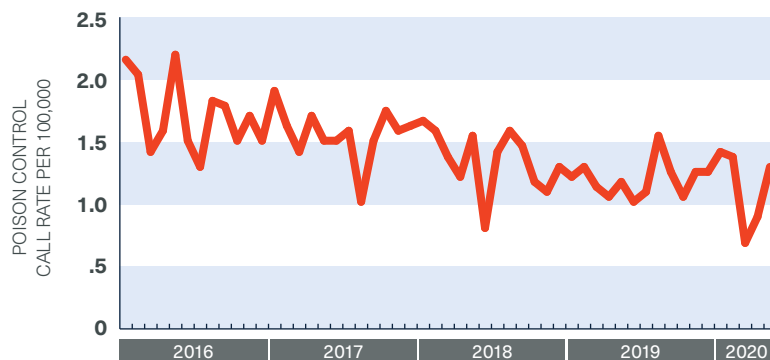
During the period of observation, there was no statistical evidence of a change in slope occurring. This means that the decline in calls was uninterrupted from January 2016 through May 2020. The decline coincides with a decline in calls seen nationwide (Anderson, 2018; Gummin, 2019). When stratifying the data by call site, the decline was observed only among calls coming from health care facilities (i.e. medical professionals). The data showed a decline in calls from health care facilities regardless of whether the individual was only exposed to a single opioid, multiple opioids, or an array of different agents. This may indicate that physicians are growing accustomed to assessing opioid exposures and administering drugs to manage overdoses, and as a result do not need to consult with the poison control center staff as frequently.

### 3.3 Temporal Patterns Based on Outpatient ED Data

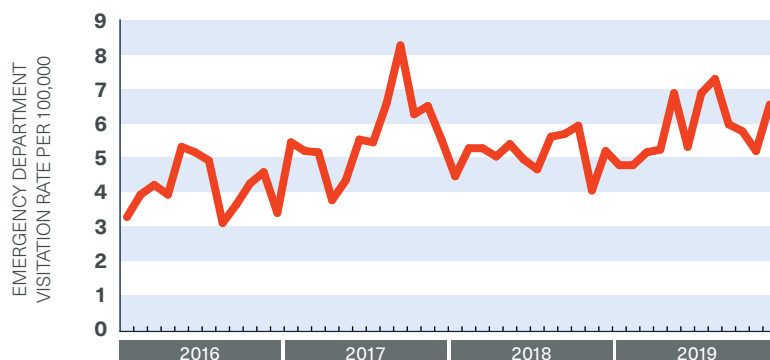
In contrast, during the same period there was a significant increase in outpatient ED visits by +0.8% per month (CI95%: 0.5%, 1.2%;  $p<0.001$ ). As seen in the poison center data, the increase in overall ED visits was uninterrupted from January 2016 to December 2020 (i.e. no statistical evidence of a change in slope occurring during the entire period). The increase was isolated to the following specific demographic subgroups:

- **Females** – there was a significant increase by 2% per month in outpatient ED visits until July 2017 (CI95%: 0.2%, 3.9%;  $p=0.03$ ), then the trend line plateaued with no significant change after that period.
- **Males** - there was a significant increase in outpatient ED visits over the whole period by 1.0% per month (CI95%: 0.6%, 1.4%;  $p<0.001$ )
- **Age group 35 to 64 years** - there was a significant increase over the whole period in outpatient ED visits

**Figure 3.1** Monthly Trend in Rate of **Poison Center Calls** for Acute Opioid Exposure-Overdoses Among Suburban Cook County Residents, January 2016 to May 2020



**Figure 3.2** Monthly Trend in Rate of **Outpatient ED Visits** for Acute Opioid Exposure-Overdoses Among Suburban Cook County Residents, January 2016 to May 2020



by 1.3% per month (CI95%: 0.9%, 1.7%;  $p<0.001$ ). No significant increase, decrease or change in trend were observed for either younger or older age groups.

- **Black/African-Americans** - there was a significant increase in outpatient ED visits over the whole period by 2.0% per month (CI95%: 1.4%, 2.5%;  $p<0.001$ ). No significant increase, decrease or change in trend were observed for other race/ethnicities.

### 3.4 Temporal Patterns Based on Inpatient Hospital Data

Admissions to hospitals (inpatient cases) for acute opioid exposure-overdoses demonstrated two significant changes. Between January 2016 and August 2016 the rate of visits was declining, and for a year between August 2016 and



August 2017 it increased. However, since August 2017 the rate of admissions has been significantly decreasing. During this final period of 2.5 years of data, it has been declining by  $-0.9\%$  per month (CI95%:  $-1.3\%$ ,  $-0.5\%$ ;  $p=0.002$ ).

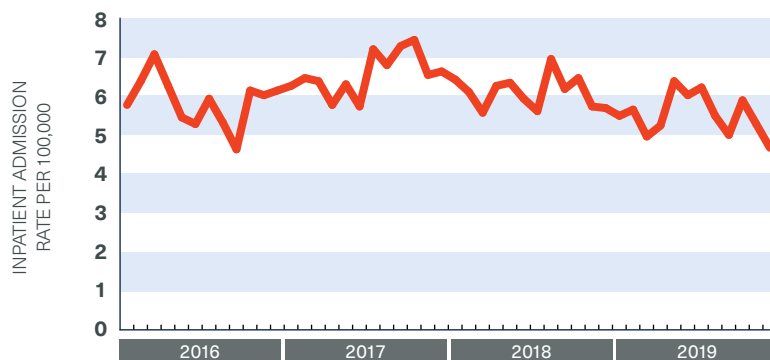
As with the outpatient ED data, the changes over time in hospital admissions varied by specific demographic subgroups:

- **Females** - Similar to outpatient ED data, admissions increased significantly until October, 2017 by  $+0.8\%$  per month (CI95%:  $0.1\%$ ,  $1.5\%$ ;  $p=0.018$ ), then began to significantly decline by  $-1.1\%$  per month until the end of the period of observation (CI95%:  $-1.6\%$ ,  $-0.5\%$ ;  $p<0.001$ ). There was no significant change in admissions for men between 2016 and 2019.
- **Age group 20 to 34 years** - There was a significant decrease in hospital admissions over the whole period by  $-0.7\%$  per month (CI95%:  $-1.2\%$ ,  $-0.3\%$ ;  $p=0.002$ ).
- **Age group 35 to 64 years** - The pattern was similar to the overall pattern for inpatient admissions. Between January 2016 until August 2016 the rate of visits was declining by  $-3.4\%$  per month, and for a year between August 2016 and August 2017 it increased by  $3.0\%$  per month. However, since August 2017 the rate of admissions has been significantly decreasing by  $-1.4\%$  per month (CI95%:  $-2.0\%$ ,  $-0.7\%$ ;  $p<0.001$ ). There was no significant change in admissions for the other age groups between 2016 and 2019.
- **White non-Hispanics** - The trend was similar to women overall. It was holding steady until December 2017, then over the last two years, admissions have significantly declined by  $-1.0\%$  per month (CI95%:  $-1.7\%$ ,  $-0.3\%$ ;  $p=0.007$ ). The trend in admissions did not significantly change over the period of observation for Black/African-American and Hispanic/Latinx residents.

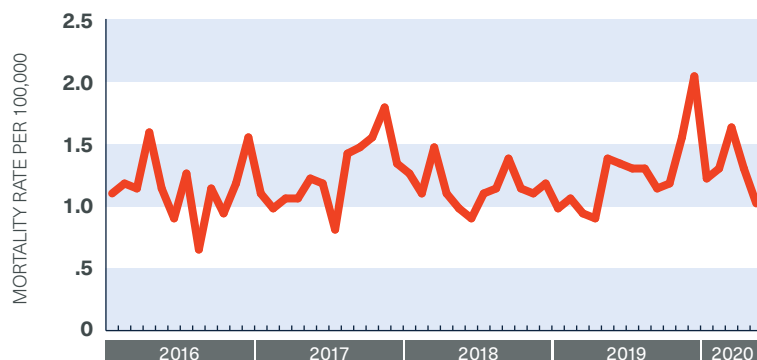
### 3.5 Temporal Patterns Based on Medical Examiner Data

The medical examiner data, which provides some of the most critical information on opioid overdoses, does not show any significant change in overall death rates between January 2016 to May 2020. There was an overall *insignificant* increase in trend of overdose deaths by  $+0.3\%$  per month (CI95%:

**Figure 3.3 Monthly Trend in Rate of Inpatient Admissions for Acute Opioid Exposure-Overdoses Among Suburban Cook County Residents, January 2016 to May 2020**



**Figure 3.4 Monthly Trend in Rate of Deaths Identified by the Cook County Medical Examiner for Acute Opioid Exposure-Overdoses Among Suburban Cook County Residents, January 2016 to May 2020**



$-0.1\%$ ,  $0.7\%$ ;  $p=0.101$ ). During the period of observation, there was no statistical evidence of a change in slope occurring during the entire period.

However, the Medical Examiner data was collected in June, 2020 and the Medical Examiner's office anticipates that the opioid overdose numbers for 2020 will be higher once they are able to complete all the related autopsies. Some regions in the country have reported an increase in opioid related overdoses during the quarantine period (Slavova, 2020) which might be exacerbated by the closure of many drug intervention programs because of stay at home orders (Khatri, 2020). However, in Cook County, the trend began to increase back in November 2019, which is three to four months prior the stay at home order by the Governor of Illinois. In fact, December 2019 had the highest number of deaths out of any month during the period of follow-up.



As with the hospital data, there were differences in trends within demographic subgroups:

- **Males** – This group showed an insignificant change in trend in deaths until May 2018, at which point deaths have significantly increased by 1.5% per month (CI95%: 0.4%, 2.6%;  $p=0.011$ ). No significant increase, decrease or change in trend was observed for females.
- **Age group 35 to 64 years** – This age group showed a significant increase in deaths over the entire period by 0.6% per month (CI95%: 0.1%, 1.0%;  $p=0.015$ ). No significant increase, decrease or change in trend were observed for other age groups.
- **Black/African-Americans** – This group showed a significant increase in deaths over the whole period by 1.3% per month (CI95%: 0.5%, 2.1%;  $p=0.003$ ). No significant increase, decrease or change in trend were observed for other race/ethnicities.

### 3.6 Summary of Trend Analysis

Evaluating the trends across all of the data systems, we observe two distinct patterns.

The data indicates a plateauing or **decline** in incidence among white non-Hispanic middle aged (35-64 years) women, but an **increase** among Black/African-American middle aged (35-64 years) men

#### White Non-Hispanic Middle Aged (35-64 Years) Women

First, white non-Hispanic middle aged (35-64 years) women have shown a decline in admissions, a plateauing in outpatient ED visits towards the end of 2017, and no change in deaths over the entire period. This indicates that there may be a plateauing or decline in incidence within this subgroup which may be attributable to changes in drug use patterns. However, limited focus on women in opioid research makes interpretation of our findings difficult (Serdarevic, 2017).

Similar to our analysis, national data showed that women were more impacted by the opioid epidemic when looking at hospital data (AHRQ, 2019). However, since 2000, the national opioid related mortality rate increased by more than 2-fold among women compared to men for both prescription opioids and heroin (DHHS, 2016). National mortality data showed that the rate has plateaued between 2016-2018 among white non-Hispanic middle aged (35-64 years) women

for heroin, but this group in particular has some of the highest mortality rates (CDC WONDER, 2020). The national mortality rate from heroin (and its adulterants/constituents) among white non-Hispanic middle aged (35-64 years) women has stabilized at 3.5 per 100,000 during the period of 2016-2018, which is much higher than the rate for all women combined (2.3 per 100,000) (CDC WONDER, 2020). As shown in our analysis, women are less likely to use heroin. The national mortality rate from prescription opioids among white non-Hispanic middle aged (35-64 years) women has stabilized at approximately 15.0 per 100,000 which is almost 2-fold higher than the rate for all women combined, 8.0 per 100,000 (CDC WONDER, 2020).

#### Black/African-American Middle Aged (35-64 Years) Men

Second, in contrast to white non-Hispanic middle aged (35-64 years) women, there was a significant increase in outpatient ED visits among Black/African-Americans, with no change in hospital admissions. However, mortality data based on medical examiner autopsies showed a steady significant increase over the entire period among Black/African-Americans. This has primarily impacted Black/African-American middle aged (35-64 years) men when stratifying the data further. This coincides with national data showing a more pronounced increase in opioid poisoning beginning in 2016 among Black/African-Americans (CDC, 2019; AHRQ, 2020; SAMSHA, 2020).

National data indicates, as does our analysis, that the sharp increase in deaths is primarily attributed to synthetic opioids such as fentanyl and its analogs (SAMSHA, 2020). Similar to opioid use among women, research is lacking that specifically focuses on proximal risk factors that may explain the sharp increase among Black/African-American middle aged (35-64 years) men. As discussed earlier, national data demonstrate that Black/African-Americans have fewer options and more barriers to accessing mental health providers including treatment for substance use disorders (Longshore, 1992; Wells, 2001; Cummings, 2013; Cummings, 2016; Cummings, 2017).

Black/African-Americans are also less likely to receive adequate assessment and treatment for mental health issues (Cooper, 2006; Le Cook, 2011), are less likely to receive prescriptions for psychiatric medications (Cooper, 2006; Hall, 2010; Cook, 2017; Carson, 2017; Ji, 2018; Cummings, 2019), and express greater unfavorable views about the medical system and drug treatment programs than their white non-Hispanic counterparts (Longshore, 1992; Cooper, 2006). Furthermore, among those with substance use disorders, Black/African-Americans are more likely to recognize their need for treatment and seek care, despite not receiving treatment (Lipari, 2013). Research indicates that the willingness to seek care is present, but systemic barriers limit access to needed services.

SECTION 4 SUMMARY

# Spatial Patterns of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

- The largest proportion of cases, regardless of data set evaluated, lived in the north and southern districts of the Cook County Department of Public Health.
- However, the highest rates were concentrated in the western and southwestern districts in communities adjacent to communities with high rates in the City of Chicago, as well as economically disadvantaged communities across the county.
- The highest mortality rates were observed in ZIP codes that principally contain the following municipalities: Worth, Broadview, Maywood and Forest Park.
- There were 37 ZIP codes that had the highest rates across all four datasets. These 37 ZIP codes compared to all of the other 81 ZIP codes in the county have a substantially higher proportion of their population who have not completed high school (16.7% vs. 9.8%), have substantially lower median household incomes (\$56,430 vs. \$79,313) and correspondingly higher poverty rates (12.7% vs 7.8%).
- Based on the mortality data alone, the opioid related death rate was slightly lower among residents covered under the jurisdiction of the Cook County Department of Public Health compared to all counties outside of Cook County and the City of Chicago.

Crude Average Annual Rates per 100,000 Residents of Illinois Residents Experiencing Acute Opioid Exposure-Overdose by Department of Public Health Jurisdiction, 2016 to June 2020

GEOGRAPHIC REGION	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
Cook County DPH	15.5	57.2	68.7	13.9
Chicago DPH	13.7	151.5	90.9	24.4
Evanston DPH	34.5	34.0	55.5	7.6
Skokie DPH	8.9	29.5	58.2	7.1
Oak Park DPH	31.0	102.6	74.5	10.2
Overlaps Stickney DPH				
60402	36.4	96.5	80.8	13.7
60455	0.0	104.9	95.8	21.6
60459	2.3	63.1	68.3	14.6
60804	1.1	77.4	49.1	10.5
Rest of Illinois*	19.8	77.7	63.3	15.2

\*The rate reflects the average over three years; Death data for the whole State of Illinois was only available for years 2016-2018.



SECTION 4

# Spatial Patterns of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

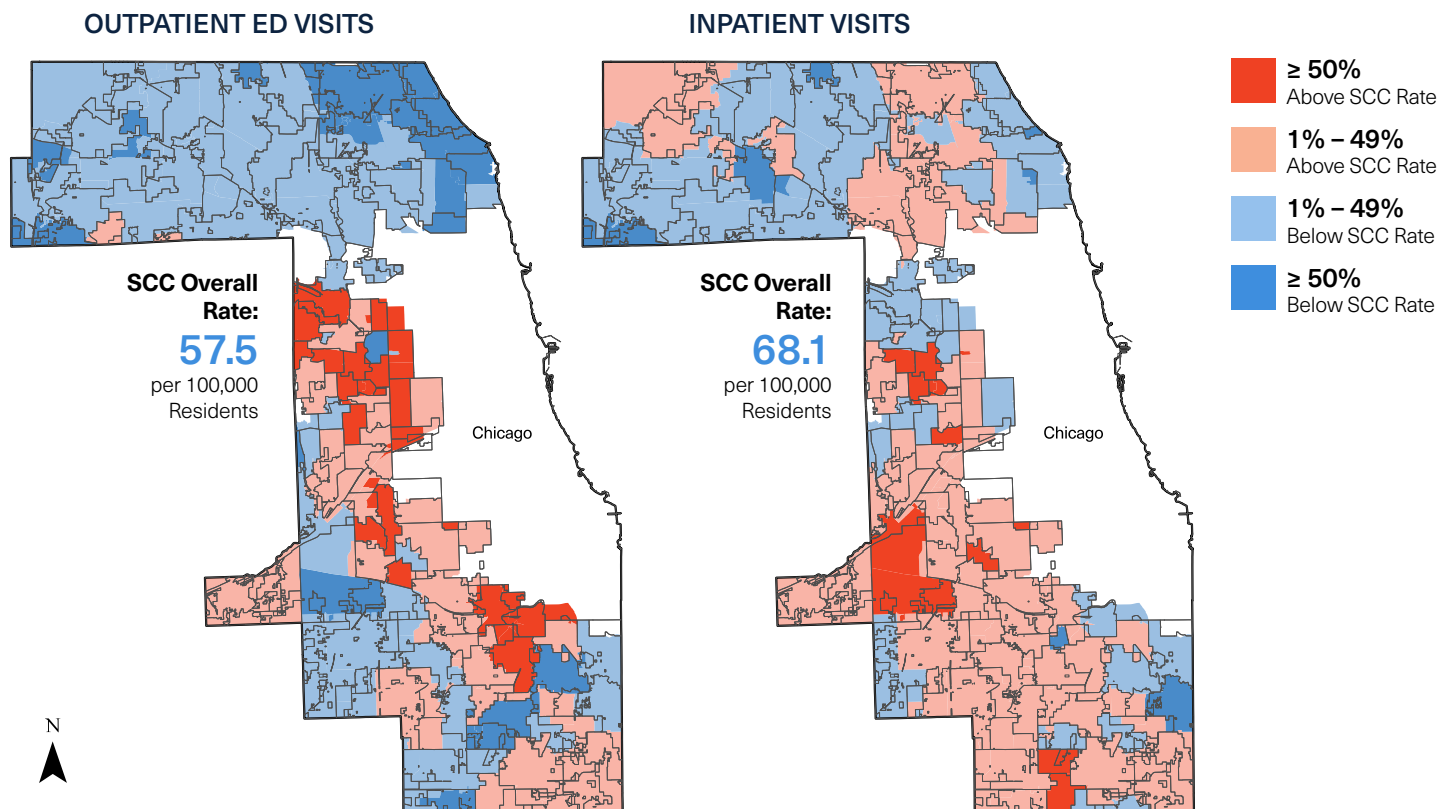
## 4.1 Summary by CCDPH Districts

The largest proportion of cases, regardless of data set evaluated, lived in the north and southern districts of the Cook County Department of Public Health (see Table 4.1 on the next page: *Distribution of Acute Opioid Exposure-Overdose by Cook County Department of Public Health Districts, 2016 to June 2020*).

The maps below show that the highest rates are concentrated in the western and southwestern districts in

communities adjacent to communities with high rates in the City of Chicago as well as economically disadvantaged communities across the county. There were 37 ZIP codes that had the highest rates across all four datasets. These 37 ZIP codes compared to all of the other ZIP codes in the county have a substantially higher proportion of their population who have not completed high school (16.7% vs. 9.8%), have substantially lower median household incomes (\$56,430 vs. \$79,313) and correspondingly higher poverty rates (12.7% vs 7.8%).

Maps 4.1: Crude Average Annual Rates per 100,000 Residents by Suburban Cook County ZIP Code



**Table 4.1:** Distribution of Acute Opioid Exposure-Overdose by Cook County Department of Public Health Districts, 2016 to June 2020

COOK COUNTY DPH DISTRICT	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
North District	792 (42.2%)	1626 (26.5%)	2681 (37.7%)	428 (27.2%)
West District	417 (22.2%)	1197 (19.5%)	1426 (20.1%)	367 (23.3%)
Southwest District	355 (18.9%)	1165 (19.0%)	1354 (19.1%)	319 (20.2%)
South District	315 (16.8%)	2147 (35.0%)	1642 (23.1%)	462 (29.3%)

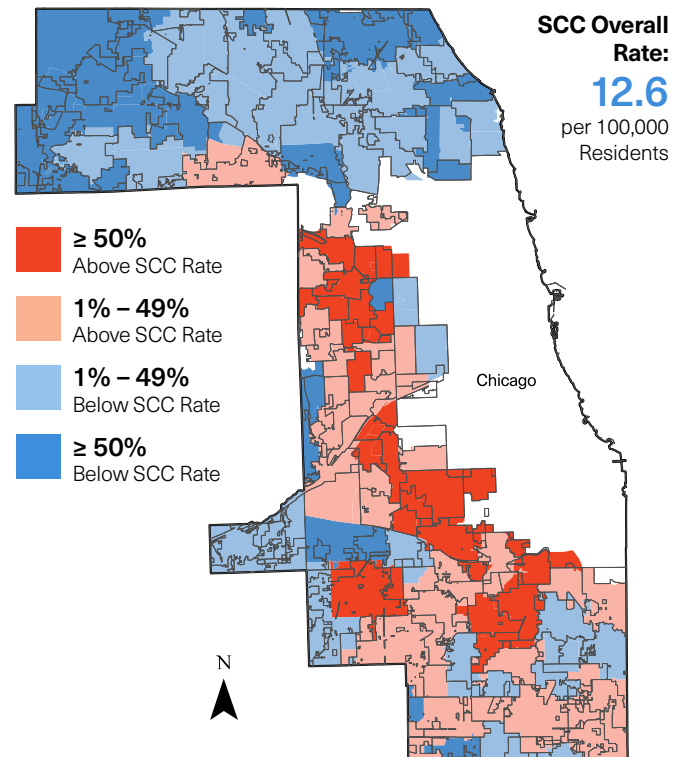
## 4.2 Spatial Distribution of Mortality Rates

Based on the mortality data alone, the opioid related death rate was slightly lower among residents covered under the jurisdiction of the Cook County Department of Public Health compared to all counties outside of Cook County and the City of Chicago (see Table 4.2 below). The highest outpatient ED visit and hospitalization rates outside of Chicago were observed in the Oak Park DPH jurisdiction and ZIP codes that are included in the Stickney Township jurisdiction.

Table 4.3 on the next page (*Suburban Cook County ZIP Codes with the Highest Crude Annual Mortality Rates of Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020*) shows the ZIP codes in suburban Cook County with the highest crude average annual mortality rates (per 100,000 residents).

Most of the ZIP codes with the highest mortality rates are located in the West and Southwest DPH districts. Most of the western district ZIP codes with very high mortality rates are adjacent to communities on the west side of Chicago that also have very high mortality rates. The highest mortality rates were observed in ZIP codes that principally contain the following municipalities: Worth, Broadview, Maywood and Forest Park.

**Map 4.2:** Crude Average Annual Mortality Rates per 100,000 Residents by Suburban Cook County ZIP Code based on Medical Examiner Data



**Table 4.2:** Crude Average Annual Rates per 100,000 Residents of Illinois Residents Experiencing Acute Opioid Exposure-Overdose by Department of Public Health Jurisdiction, 2016 to June 2020

GEOGRAPHIC REGION	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
Cook County DPH	15.5	57.2	68.7	13.9
Chicago DPH	13.7	151.5	90.9	24.4
Evanston DPH	34.5	34.0	55.5	7.6
Skokie DPH	8.9	29.5	58.2	7.1
Oak Park DPH	31.0	102.6	74.5	10.2

(continued)

GEOGRAPHIC REGION	ILLINOIS POISON CENTER	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
60402*	36.4	96.5	80.8	13.7
60455*	0.0	104.9	95.8	21.6
60459*	2.3	63.1	68.3	14.6
60804*	1.1	77.4	49.1	10.5
Rest of Illinois**	19.8	77.7	63.3	15.2

\* These zip codes overlap Stickney DPH

\*\* The rates reflect the average over three years; Death data for the whole State of Illinois was only available for years 2016-2018.

**Table 4.3:** Suburban Cook County ZIP Codes with the Highest Crude Annual Mortality Rates of Residents Experiencing Acute Opioid Exposure-Overdose, 2016 to June 2020

RESIDENTIAL ZIP CODE	CORRESPONDING MUNICIPALITIES	CCDPH DISTRICT	DEATHS	MORTALITY RATE BASED ON COOK COUNTY MEDICAL EXAMINER DATA (Per 100,000 Residents)
<b>STATEWIDE AVERAGE (CDC ESTIMATE)</b>				<b>17.0</b>
60482	<b>Principal City:</b> Worth <b>Sections of:</b> Palos Heights, Palos Hills, Alsip, Chicago Ridge	Southwest	21	<b>42.2</b>
60155	<b>Principal City:</b> Broadview, Maywood <b>Sections of:</b> North Riverside, Bellwood, La Grange Park, Westchester	West	14	<b>39.2</b>
60153	<b>Principal City:</b> Maywood, Broadview <b>Sections of:</b> Forest Park, Melrose Park, Bellwood, River Forest	West	41	<b>37.8</b>
60130	<b>Principal City:</b> Forest Park <b>Sections of:</b> Berwyn, North Riverside, Maywood, Oak Park, River Forest	West	24	<b>37.6</b>
60428	<b>Principal City:</b> Markham, Harvey <b>Sections of:</b> Country Club Hills, Oak Forest, Hazelcrest, Midlothian	South	17	<b>31.0</b>
60456	<b>Principal City:</b> Hometown, Oak Lawn <b>Sections of:</b> Chicago, Evergreen Park	Southwest	6	<b>30.7</b>
60171	<b>Principal City:</b> River Grove <b>Sections of:</b> Melrose Park, Elmwood Park, Franklin Park	West	13	<b>28.2</b>
60513	<b>Principal City:</b> Brookfield <b>Sections of:</b> North Riverside, La Grange, La Grange Park, Lyons, Mc Cook, Riverside	West	24	<b>28.0</b>
60426	<b>Principal City:</b> Harvey, Markham, Dixmoor, Phoenix <b>Sections of:</b> Dolton, East Hazelcrest, Hazelcrest, Midlothian, Posen, South Holland, Harvey, Markham	South	37	<b>27.8</b>

(continued)



RESIDENTIAL ZIP CODE	CORRESPONDING MUNICIPALITIES	CCDPH DISTRICT	DEATHS	MORTALITY RATE BASED ON COOK COUNTY MEDICAL EXAMINER DATA (Per 100,000 Residents)
STATEWIDE AVERAGE (CDC ESTIMATE)				17.0
60160	<b>Principal City:</b> Melrose Park <b>Sections of:</b> North Lake, Bellwood, Berkeley, Elmwood Park, Franklin Park, Maywood, River Forest, River Grove, Stone Park	West	31	27.1
60165	<b>Principal City:</b> Melrose Park, Stone Park <b>Sections of:</b> North Lake	West	6	27.0
60415	<b>Principal City:</b> Chicago Ridge <b>Sections of:</b> Palos Hills, Bridgeview, Oak Lawn, Worth	Southwest	16	25.1
60472	<b>Principal City:</b> Robbins <b>Sections of:</b> Blue Island, Alsip, Crestwood, Midlothian	South	6	24.7
60131	<b>Principal City:</b> Franklin Park, Schiller Park <b>Sections of:</b> Chicago, North Lake, Melrose Park, Bensenville, River Grove	West	19	23.3
60803	<b>Principal City:</b> Alsip, Chicago, Merrionette Park <b>Sections of:</b> Blue Island, Palos Heights, Chicago Ridge, Crestwood, Oak Lawn, Worth	Southwest	23	22.9
60707	<b>Principal City:</b> Chicago, Elmwood Park <b>Sections of:</b> River Forest, River Grove	West	44	22.8
60453	<b>Principal City:</b> Oak Lawn <b>Sections of:</b> Chicago, Hometown, Alsip, Bridgeview, Chicago Ridge, Evergreen Park	Southwest	58	22.7
60455	<b>Principal City:</b> Bridgeview, Bedford Park, Oak Lawn <b>Sections of:</b> Burbank, Hickory Hills, Palos Hills, Justice	Southwest	16	21.6
60163	<b>Principal City:</b> Berkeley, Hillside, Melrose Park <b>Sections of:</b> Elmhurst, Bellwood	West	5	21.3
60104	<b>Principal City:</b> Bellwood <b>Sections of:</b> Melrose Park, Berkeley, Hillside, Maywood	West	18	21.0
60805	<b>Principal City:</b> Evergreen Park, Chicago <b>Sections of:</b> Hometown, Oak Lawn	Southwest	18	20.1
60458	<b>Principal City:</b> Justice, Bedford Park <b>Sections of:</b> Hickory Hills, Bridgeview, Oak Lawn, Willow Springs	Southwest	13	20.0

\*Population data for calculating the rates are based on 2010 U.S. Census counts by ZIP code.

For comparison, the table below provides the ZIP codes in the City of Chicago with opioid related death rates above 20 per 100,000 residents (see Table 4.4 below). The communities hit hardest are on the west side of Chicago

which are also closest to the communities hit hardest in suburban Cook County. There were only three ZIP codes in the north and northwest districts of the city that had rates above 20 per 100,000 residents.

**Table 4.4:** City of Chicago ZIP Codes with the Highest Crude Annual Mortality Rates of Acute Opioid Exposure-Overdose, 2016 to June 2020

ZIP CODE	DEATHS	RATE PER 100K	AREA	NEIGHBORHOOD	REGION
60624	160	93.3	Chicago	West Garfield Park	West
60644	185	84.5	Chicago	Austin	West
60612	113	75.0	Chicago	East Garfield Park	West
60651	154	53.3	Chicago	Humboldt Park	West
60601	25	50.0	Chicago	Near Eastside	Central
60619	121	42.1	Chicago	Chatham	Southeast
60621	64	39.6	Chicago	Englewood	Southeast
60607	42	39.1	Chicago	West Loop	Central
60636	71	38.6	Chicago	West Englewood	Southeast
60628	125	38.5	Chicago	Roseland	Far South
60623	153	36.9	Chicago	North Lawndale	West
60649	74	35.3	Chicago	South Shore	Southeast
60620	108	33.2	Chicago	Auburn Gresham	Southeast
60653	39	29.0	Chicago	Oakland	Southeast
60609	84	28.8	Chicago	Back of the Yards	Southwest
60637	62	27.8	Chicago	Washington Park / Woodlawn	Southeast
60633	16	27.5	Chicago	South Deering	Far South
60617	90	23.8	Chicago	Calumet Heights	Far South
60639	95	23.4	Chicago	Belmont Cragin / Hermosa	Northwest
60642	19	22.8	Chicago	West Town	West
60640	67	22.6	Chicago	Uptown	North
60622	53	22.4	Chicago	Ukrainian Village	West
60626	49	21.7	Chicago	East Rogers Park	North
60615	39	21.3	Chicago	Hyde Park	Southeast
60629	105	20.5	Chicago	West Lawn	Southwest

\*Population data for calculating the rates are based on 2010 U.S. Census counts by ZIP code.





## SECTION 5 SUMMARY

## Description of Comorbidities, In-Hospital Care and Discharge Status of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

- Among those admitted to a hospital, the mean length of hospitalization was 6.0 days (sd=6.5).
- Approximately 10% of all inpatient admissions for opioid intoxication-overdose suffered from a concomitant traumatic injury. Most of the traumatic injuries were caused by falls or motor vehicle collisions at the time of opioid intoxication. Research has demonstrated that individuals using opioids chronically, especially among the elderly, have an increased risk of fractures, predominately from an increased risk of falls as a result of impaired mobility and balance. Similar to ethanol, opioids also impair psychomotor skills that are critical to safe driving.
- The most prevalent comorbidities among those treated for acute opioid exposures-overdoses were similar to chronic conditions seen in the general population including fluid and electrolyte disorders, diseases of cardiovascular system, chronic pulmonary diseases, diabetes, hypothyroidism and renal failure.
- Among the outpatient ED cases, 71.7% reported using heroin. However, only 23.7% of those who reported use of heroin were diagnosed with substance use disorder (1043 out of 4397 reporting heroin use in the outpatient ED setting).
- Almost 25% of the inpatient cases had a comorbid diagnosis of depression. This is highly consistent with national data for persons with substance use disorders. However, only 7.4% of outpatient ED cases were diagnosed with depression.
- The low number of outpatient ED cases diagnosed with substance use disorders and other psychiatric conditions indicates that comprehensive psychiatric assessments along with substance use assessments are not occurring for most of these outpatient ED visits. The hospital setting is one of the few places that individuals with psychiatric conditions interface with the public health apparatus. Medical staff and social workers in the hospital setting, unlike law enforcement, are well equipped to assess and refer individuals to either inpatient or community programs. Given the high risk for suicide and adverse outcomes from unmanaged psychiatric conditions and substance use disorders, this is a lost opportunity to intervene and assist Cook County residents.
- In the outpatient ED dataset, 7.9% of the patients left against medical advice. Studies show that individuals with opioid related substance use disorders are more likely to leave the hospital against medical advice, and the probability of this occurring increases when the medical staff fails to adequately manage withdrawal symptoms while the patient is in the hospital. In addition, leaving the hospital against medical advice is associated with an increased risk of readmission with more serious health conditions within 14 days, being readmitted multiple times during the year, and longer hospital stays.



## SECTION 5

# Description of Comorbidities, In-Hospital Care and Discharge Status of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

The outpatient ED and inpatient data systems contain valuable information that is not available in the poison center and medical examiner data. This section will specifically summarize the hospital data only.

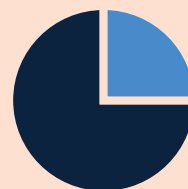
### 5.1 Comorbidities

For most of those who died from an opioid overdose, the Cook County Medical Examiner public data did not provide information on comorbid conditions identified during the autopsy on the public death records. The most prevalent comorbid conditions identified during autopsy were cardiovascular diseases. Because of the potential incompleteness of comorbid conditions in the Medical Examiner data and poison center data, the analysis of comorbidities is restricted to the hospital data.

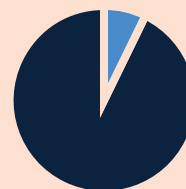
The most prevalent comorbidities were similar to chronic conditions seen in the general population including fluid and electrolyte disorders, diseases of cardiovascular system, chronic pulmonary diseases, diabetes, hypothyroidism and renal failure (see Table 5.1 on the next page *Serious Comorbidities in Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020*). The hospital data does not provide information on whether these comorbidities were caused or exacerbated by substance use disorders. While fluid and electrolyte disorders were the most prevalent comorbid diagnosis, these conditions predominately occurred in patients over 55 years of age and among those with chronic pain and other serious health conditions.

Based on the hospital data, less than a quarter of the outpatient ED and inpatient cases had a diagnosis of substance use disorders (see Table 5.1), despite care being provided for acute exposure-overdose. Among the outpatient ED cases, 71.7% reported using heroin. However, only 23.7% of those who reported use of heroin were diagnosed with substance use disorder (1043 out of 4397 reporting heroin

#### Concurrent Diagnosis of Depression



Almost **25%** of the inpatient cases had a comorbid diagnosis of depression. This is highly consistent with national data.



However, only **7.4%** of outpatient ED cases were diagnosed with depression indicating that psychiatric assessments in the outpatient ED setting is limited.

use in the outpatient ED setting). As stated in a previous section of this report, this indicates that medical providers in the hospital setting may fail to either assess for substance use disorders or code for it in the medical records. A failure to screen for substance use disorders and refer patients to drug treatment programs in the ED has been reported previously (SAMSHA, 2013), as well as an unwillingness by the majority of ED physicians to prescribe self-administered naloxone to persons reporting opioid misuse (Beletsky, 2007).

In conjunction with the fact that only 7.4% of outpatient ED cases have a diagnosis for depression, which is almost 3.5-fold lower than national estimates for those with opioid related substance use disorders, indicates that comprehensive psychiatric assessments along with substance use disorder assessments are not occurring for most of these outpatient ED visits. The hospital setting is one of the few places that individuals with psychiatric conditions interface with the public health apparatus. Medical staff and social workers in the hospital setting, unlike law enforcement,

**Table 5.1:** Serious Comorbidities in Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020\*

COMORBID CONDITIONS	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
Diseases of Cardiovascular System	n/a (n/a)	n/a (n/a)	85 (5.4%)
Congestive Heart Failure	93 (1.5%)	963 (13.6%)	0 (0.0%)
Cardiac Arrhythmia	356 (5.8%)	1595 (22.5%)	0 (0.0%)
Valvular Disease	28 (0.5%)	342 (4.8%)	0 (0.0%)
Peripheral Vascular Disorders	41 (0.7%)	428 (6.0%)	0 (0.0%)
Hypertension Uncomplicated	830 (13.5%)	2563 (36.1%)	0 (0.0%)
Hypertension Complicated	115 (1.9%)	1337 (18.8%)	0 (0.0%)
Paralysis	8 (0.1%)	158 (2.2%)	0 (0.0%)
Other Neurological Disorders	145 (2.4%)	916 (12.9%)	1 (0.1%)
Pulmonary Circulation Disorders	10 (0.2%)	319 (4.5%)	1 (0.1%)
Chronic Pulmonary Disease	478 (7.8%)	1668 (23.5%)	21 (1.3%)
Diabetes Uncomplicated	276 (4.5%)	653 (9.2%)	11 (0.7%)
Diabetes Complicated	88 (1.4%)	968 (13.6%)	0 (0.0%)
Hypothyroidism	99 (1.6%)	914 (12.9%)	0 (0.0%)
Renal Failure	95 (1.5%)	1069 (15.0%)	0 (0.0%)
Liver Disease	46 (0.7%)	446 (6.3%)	9 (0.6%)
Peptic Ulcer Disease excluding bleeding	1 (0.0%)	70 (1.0%)	0 (0.0%)
AIDS/HIV	6 (0.1%)	16 (0.2%)	0 (0.0%)
Lymphoma	9 (0.1%)	145 (2.0%)	1 (0.1%)
Metastatic Cancer	41 (0.7%)	962 (13.5%)	0 (0.0%)
Solid Tumor without Metastasis	78 (1.3%)	1044 (14.7%)	0 (0.0%)
Rheumatoid Arthritis/collagen	55 (0.9%)	311 (4.4%)	0 (0.0%)
Coagulopathy	23 (0.4%)	536 (7.5%)	0 (0.0%)
Obesity	92 (1.5%)	1028 (14.5%)	23 (1.5%)
Weight Loss	21 (0.3%)	931 (13.1%)	0 (0.0%)
Fluid and Electrolyte Disorders	217 (3.5%)	2862 (40.3%)	0 (0.0%)
Blood Loss Anemia	1 (0.0%)	61 (0.9%)	0 (0.0%)
Deficiency Anemia	21 (0.3%)	360 (5.1%)	0 (0.0%)
Alcohol	318 (5.2%)	580 (8.2%)	0 (0.0%)
All Other	1315 (21.4%)	1734 (24.4%)	0 (0.0%)
Psychoses	66 (1.1%)	138 (1.9%)	11 (0.7%)
Depression	453 (7.4%)	1767 (24.9%)	0 (0.0%)

\*Illinois Poison Center data does not uniformly collect information on comorbidities



are well equipped to assess and refer individuals to either inpatient or community programs. Given the high risk for suicide and adverse outcomes from unmanaged psychiatric conditions and substance use disorders, this is a lost opportunity to intervene and assist Cook County residents.

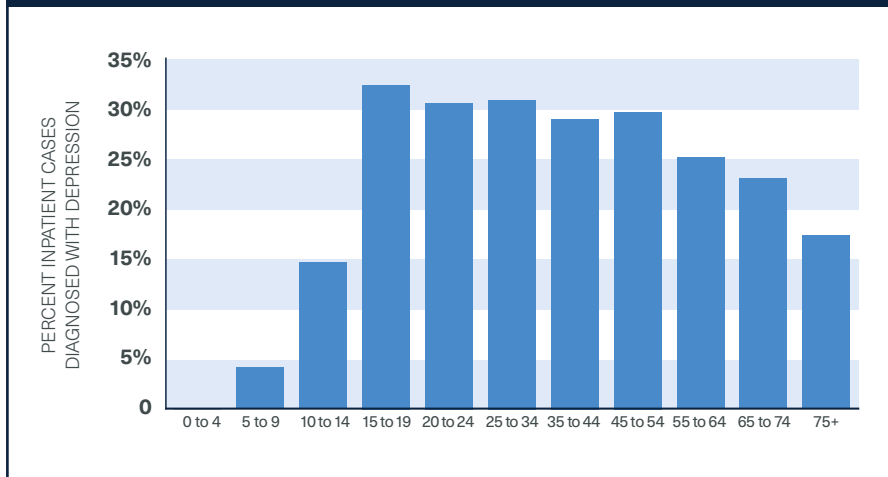
As for the inpatient cases, almost a quarter had a comorbid diagnosis of depression. This is highly consistent with national data which estimates that 20-27% of persons with opioid related substance use disorders suffer from major depressive episodes. The proportion increases to approximately 30% when including any serious mental illness (SAMSHA, 2018). The proportion of persons diagnosed with depression was highest among patients between the ages of 15-54 years and began to decline in older patients (see Figure 5.1 at right). In addition, persons with a diagnosis of a chronic pain condition were no more likely to have a diagnosis of depression than persons without a chronic pain condition (32% vs 35%).

## 5.2 Details of Those Treated in the Hospital Setting

Nearly all of the outpatient ED visits and inpatient admissions were for emergent cases. However, 2.7% of the outpatient ED (n=167) and 18.9% of the inpatient cases (n=1343) were elective admissions. The elective cases were predominately over the age of 65 to 74 years, with chronic pain conditions (73.3% elective cases vs. 63.9% emergent cases). Almost none of elective cases were provided or referred to a drug treatment program (n=7). These cases were predominately individuals seeking surgical interventions for musculoskeletal and connective tissue disorders (47.0%, n=631; vs 5.8% non-elective cases) or malignant neoplasms (10.2%, n=137).

Approximately 10% of all inpatient admissions for opioid intoxication-overdose suffered from a concomitant traumatic injury (see Table 5.2 on the next page *Causes of Concomitant Traumatic Injury Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020*). Most of the traumatic injuries were caused by falls or motor vehicle collisions at the time of opioid intoxication. The mean age of those suffering fall related injuries was 71.7 years compared to 55.0 among those not suffering a traumatic injury. Research has demonstrated that individuals using opioids chronically, especially among the elderly, have an increased risk of fractures, predominately from an increased risk of falls as a result of impaired mobility and balance (Vestergaard, 2006). However, similar to ethanol, opioids also impair psychomotor skills that are critical to safe driving. Interestingly, persons with both a traumatic injury and

**Figure 5.1 Proportion of Inpatient Cases Treated for Acute Opioid Exposure-Overdose with a Comorbid Diagnosis of Depression, 2016 to 2019**



opioid intoxication had a lower overall in-hospital mortality compared to those without traumatic injury (18/748=2.4% vs 371/6355=5.8%).

Thirty of the patient visits in both the outpatient ED and inpatient datasets combined involved a concurrent temperature related injury (cold injury, n=28; heat injury, n=2). There were also 138 visits involving individuals reporting homelessness. Only one of the concurrent temperature related injuries occurred in a patient reporting homelessness. Among those admitted to a hospital, the mean length of hospitalization was 6.0 days (sd=6.5).

While only 2.6% (n=162) of the outpatient ED visits required surgical intervention, 40.6% of the inpatient cases required surgical intervention. The discharge status of patients seeking care in the hospital setting provides information about the population served (see Table 5.3 on the next page *Discharge Status of Outpatient ED and Inpatient Cases Treated in Hospitals for Acute Opioid Exposure-Overdose, 2016 to 2019*). In the outpatient ED dataset, the vast majority (85.6%) were discharged to self-care, but 7.9% of the patients left against medical advice. Studies show that individuals with opioid related substance use disorders are more likely to leave the hospital against medical advice and the probability of this occurring increases when the medical staff fails to adequately manage withdrawal symptoms while the patient is in the hospital (Choi, 2011; Lail, 2018). In addition, leaving the hospital against medical advice is associated with an increased risk of readmission with more serious health conditions within 14 days, being readmitted multiple times during the year, and longer hospital stays (Choi, 2011). In contrast, less than half of the inpatient visits resulted in a routine discharge to self-care. This coincides with the large number of individuals with chronic conditions.

**Table 5.2:** Causes of Concomitant Traumatic Injury Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020

CAUSE OF INJURY (OTHER THAN POISONING)	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
Accidental Explosion	n/a (n/a)	0 (0.0%)	1 (0.0%)	0 (0.0%)
Accidental Firearm	n/a (n/a)	0 (0.0%)	9 (0.1%)	0 (0.0%)
Assault / Homicide	3 (0.2%)	3 (0.0%)	9 (0.1%)	7 (0.4%)
Caught between objects	n/a (n/a)	0 (0.0%)	2 (0.0%)	0 (0.0%)
Thermal Source	n/a (n/a)	0 (0.0%)	3 (0.0%)	2 (0.1%)
Cut/Pierce Instrument	n/a (n/a)	1 (0.0%)	3 (0.0%)	0 (0.0%)
Falls	n/a (n/a)	95 (1.5%)	590 (8.3%)	3 (0.2%)
Motor Vehicle Collision	n/a (n/a)	54 (0.9%)	85 (1.2%)	0 (0.0%)
Machinery	n/a (n/a)	0 (0.0%)	2 (0.0%)	0 (0.0%)
Medical error	186 (9.9%)	0 (0.0%)	4 (0.1%)	0 (0.0%)
Nature Environment	n/a (n/a)	7 (0.1%)	9 (0.1%)	0 (0.0%)
Overexertion	n/a (n/a)	2 (0.0%)	2 (0.0%)	0 (0.0%)
Struck by against	n/a (n/a)	6 (0.1%)	10 (0.1%)	0 (0.0%)
Suicide / Suicide Attempt	957 (50.9%)	10 (0.2%)	19 (0.3%)	53 (3.4%)

**Table 5.3:** Discharge Status of Outpatient ED and Inpatient Cases Treated in Hospitals for Acute Opioid Exposure-Overdose, 2016 to 2019

DISCHARGE STATUS	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)
Routine Discharge (To Home or Self Care)	5250 (85.6%)	3289 (46.3%)
Home Health Care Service	33 (0.5%)	1117 (15.7%)
Psychiatric Hospital or Unit	206 (3.4%)	266 (3.7%)
Acute Care Hospital/Facility	35 (0.6%)	122 (1.7%)
Rehab Facility or Hospital Unit	3 (0.0%)	248 (3.5%)
Intermediate Care Facility	3 (0.0%)	15 (0.2%)
Skilled Nursing Facility	34 (0.6%)	1349 (19.0%)
Court/Law Enforcement	52 (0.8%)	15 (0.2%)
Long-Term Care Hospital	0 (0.0%)	36 (0.5%)
Left Against Medical Advice	485 (7.9%)	239 (3.4%)
Still Patient or Expected To Return For	5 (0.1%)	0 (0.0%)
Another Type of Health Care Institution	12 (0.2%)	18 (0.3%)
Hospice - Home	6 (0.1%)	207 (2.9%)
Expired (or Did Not Recover-Christian Scientist Patient)	11 (0.2%)	182 (2.6%)



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**SECTION 6 SUMMARY**

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## **Description of Reported and Identified Agents Among Suburban Cook County Residents Suffering from Acute Opioid Exposures-Overdoses**

- The medical examiner data demonstrates that drug exposure combinations are relatively unique to the individual. Of the 1576 opioid related overdose deaths identified by the Cook County Medical Examiner's Office, there were 558 different drug combinations identified in the individuals who died.
- Most cases of death involved more than one concurrent drug exposure (86.3%). The most common combinations involved heroin, fentanyl, fentanyl analogs, ethanol and cocaine.
- While national data shows that only 8% of persons who misuse opioids are using heroin and its illegal adulterants (including fentanyl and its analogs), in suburban Cook County nearly all of the opioid fatal overdoses involved heroin and/or fentanyl (82.9%).
- Fentanyl and its analogs were more frequently identified in the toxicological screening than heroin (63.0% vs. 55.1%).
- 677 (43.0%) cases of the 1576 deaths identified by the ME were concurrently exposed to least one additional respiratory depressant or drug that causes excessive drowsiness— ethanol, barbiturates, benzodiazepines, other pharmaceutical sedative-hypnotics or anxiolytics, muscle relaxants or antihistamines. Concomitant exposure to these agents increases the risk of respiratory arrest or aspiration of fluids.
- Among the 216 (13.7%) cases where only one drug was identified on the toxicological screening, these single drug overdose cases most commonly involved heroin (n=110), fentanyl (n= 55), an unspecified opioid (n=24), hydrocodone (n=10) or methadone (n=10).
- Of the 17% of deaths that did not involve heroin and/or fentanyl (n=269), the most common agents were as follows: hydrocodone, n=97; an unidentified opioid, n=73; methadone, n=44; oxycodone, n=34; hydromorphone, n=27; and morphine, n=23. Only 51 of the 269 deaths (19.0%) that did not involve heroin and/or fentanyl resulted from an exposure to one opioid agent.

## SECTION 6

# Description of Reported and Identified Agents Among Suburban Cook County Residents Suffering from Acute Opioid Exposures-Overdoses

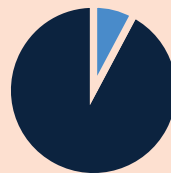
## 6.1 Concurrent Drug Exposures Among Persons Suffering from Acute Opioid Intoxication-Overdose

Each data system captures different information on agents of exposure. The poison center data captures detailed information about known specific agents. However, if the caller is unaware of concurrent exposures and fails to report them, then the information will not be captured. In addition, the poison center receives a disproportionate number of calls relating to suicide attempts. These exposures will disproportionately involve psychiatric medication, sedative-hypnotics and over-the-counter medications. It is common for individuals who attempt suicide to consume all of their medications found in the medicine cabinet.

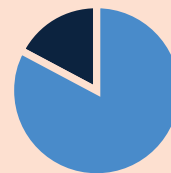
The hospital data primarily captures information about drug classes rather than information about specific agents. The ICD-10 coding system is broad by design and most agents are coded by drug class (e.g. barbiturates, benzodiazepines, "other opioids" which covers nearly all prescription opioids). In addition, similar to the poison center data, drug misuse and exposures are self-reported, especially in the outpatient ED setting. Screening for substance use disorders are often broad relating to drug classes (e.g. ethanol, opioids, cannabinoids), rather than specific to individual agents. Also, the patient will only be able to report agents they are aware of being exposed to; they will unlikely report exposure to adulterants. Furthermore, a greater proportion of the hospital patients will be exposed to opioids from prescriptions they are receiving to manage pain. For this reason, the hospital data will capture the primary drugs misused, but will not provide an accurate toxicological profile of all actual exposures. Hospital data will also capture medications used to treat chronic conditions as seen in Table 6.1 on the next page (*Reported and Identified Exposures by Drug Class*

### Fentanyl is a Key Cause of Mortality

#### MISUSE WITH FENTANYL



#### OVERDOSES WITH FENTANYL



Despite only **8%** of persons misusing opioids use heroin and its illegal adulterants (including fentanyl and its analogs), nearly all of the opioid overdoses involved heroin and/or fentanyl in suburban Cook County (**82.9%**).

*Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020).*

Since the poison center and hospital data capture information on the drugs an individual reports to primarily misuse or the agent they believe they were exposed to (unaware of any adulterants mixed into the drugs consumed), the medical examiner data provides the most accurate picture of actual drug exposures. Because of the limitations of the poison center and hospital data, this part of the analysis primarily focuses on medical examiner data.

The medical examiner data demonstrates that drug exposure combinations are relatively unique to the individual. Of the 1576 opioid related overdose deaths identified by the Cook County medical examiner, there 558 different drug combinations identified in the individuals who died. Most cases of death involved more than one concurrent drug exposure (86.3%; see Table 6.2 on next page *Number of Agents Reported/Identified Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020*). In only 216 (13.7%) cases was only one drug

**Table 6.1:** Reported and Identified Exposures by Drug Class Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020

	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
<b>Agents Associated with Substance Use Disorders</b>				
<b>Opioids</b>	<b>1879 (100.0%)</b>	<b>6135 (100.0%)</b>	<b>7103 (100.0%)</b>	<b>1576 (100.0%)</b>
Cannabinoids	29 (1.5%)	155 (2.5%)	370 (5.2%)	0 (0.0%)
Stimulants	74 (3.9%)	211 (3.4%)	456 (6.4%)	548 (34.8%)
Ethanol	0 (0.0%)	304 (5.0%)	545 (7.7%)	367 (23.3%)
Hallucinogens (inc. MDMA, PCP)	6 (0.3%)	5 (0.1%)	26 (0.4%)	23 (1.5%)
Sedative-Hypnotics and Anxiolytics	426 (22.7%)	187 (3.0%)	725 (10.2%)	322 (20.4%)
Inhalants and Other Volatile Solvents	2 (0.1%)	2 (0.0%)	0 (0.0%)	1 (0.1%)
Toxic Muscle Relaxants and Related Drugs	106 (5.6%)	12 (0.2%)	40 (0.6%)	43 (2.7%)
Nicotine Addiction	n/a (n/a)	1402 (22.9%)	1568 (22.1%)	0 (0.0%)
Other Polysubstance Abuse	2 (0.1%)	236 (3.8%)	256 (3.6%)	0 (0.0%)
<b>Pharmaceutical Agents not Typically Associated with Substance Use Disorder</b>	<b>281 (15.0%)</b>	<b>184 (3.0%)</b>	<b>1190 (16.8%)</b>	<b>186 (11.8%)</b>
Antidepressants, Antipsychotics and other Neuroleptics	74 (3.9%)	25 (0.4%)	121 (1.7%)	105 (6.7%)
Common Non-Opioid Cold Medications	51 (2.7%)	2 (0.0%)	3 (0.0%)	17 (1.1%)
Non Opioid Anesthetics, Analgesics & Antipyretics	136 (7.2%)	74 (1.2%)	218 (3.1%)	38 (2.4%)
Other Pharmaceutical Agents	0 (0.0%)	71 (1.2%)	814 (11.5%)	85 (5.4%)
<b>Toxic Effects of Non-Medicinals</b>	<b>0 (0.0%)</b>	<b>19 (0.3%)</b>	<b>83 (1.2%)</b>	<b>0 (0.0%)</b>

**Table 6.2:** Number of Agents Reported/Identified Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020

NUMBER OF AGENTS REPORTED/IDENTIFIED	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
1	843 (44.9%)	5638 (91.9%)	5446 (76.7%)	216 (13.7%)
2	510 (27.1%)	447 (7.3%)	1353 (19.0%)	418 (26.5%)
3	292 (15.5%)	40 (0.7%)	249 (3.5%)	371 (23.5%)
4	119 (6.3%)	8 (0.1%)	38 (0.5%)	281 (17.8%)
5	47 (2.5%)	1 (0.0%)	16 (0.2%)	154 (9.8%)
6	23 (1.2%)	1 (0.0%)	1 (0.0%)	64 (4.1%)
7	20 (1.1%)	0 (0.0%)	0 (0.0%)	49 (3.1%)
8	7 (0.4%)	0 (0.0%)	0 (0.0%)	17 (1.1%)
9	5 (0.3%)	0 (0.0%)	0 (0.0%)	1 (0.1%)
10	2 (0.1%)	0 (0.0%)	0 (0.0%)	4 (0.3%)
11	3 (0.2%)	0 (0.0%)	0 (0.0%)	1 (0.1%)
12	3 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
13	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
14	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
15	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
16	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
17	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)



identified on the toxicological screening conducted by the medical examiner; 209 of these single drug overdose cases involved either heroin (n=110), fentanyl (n= 55), an unspecified opioid (n=24), hydrocodone (n=10) or methadone (n=10).

Table 6.3 below identifies the top 20 most frequent combinations that account for only 43.4% of all autopsies. In the 20 most common drug combinations, only heroin, fentanyl, fentanyl analogs, ethanol and cocaine were identified.

Despite national data indicating that only 8% of persons misusing opioids use heroin and its illegal adulterants (including fentanyl and its analogs), nearly all of the opioid overdoses involved heroin and/or fentanyl and its analogs in suburban Cook County (n=1307; 82.9%). In fact, fentanyl and its analogs were involved in more deaths than heroin (see Table 6.4 on the next page *Reported and Identified Exposures by Specific Drugs Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020*). To complicate matters further, 537 (41.1% of the 1307 testing positive for heroin and/or fentanyl) cases were concurrently exposed to least one additional respiratory depressant or drug that causes excessive drowsiness—

ethanol, barbiturates, benzodiazepines, other pharmaceutical sedative-hypnotics or anxiolytics, muscle relaxants or antihistamines. Concomitant exposure to these agents increases the risk of respiratory arrest or aspiration of fluids.

Of the 17% of deaths that did not involve heroin and/or fentanyl (n=269), the most common agents were as follows: hydrocodone, n=97; an unidentified opioid, n=73; methadone, n=44; oxycodone, n=34; hydromorphone, n=27; and morphine, n=23. Only 51 of the 269 deaths (19.0%) that did not involve heroin and/or fentanyl resulted from exposure to one opioid agent. In this same group of 269 overdoses not involving illegal opioids, 78 involved exposures to two or more concurrent opioids and 140 cases (52.1%) were concurrently exposed to least one additional respiratory depressant or drug that causes excessive drowsiness – ethanol, barbiturates, benzodiazepines, other pharmaceutical sedative-hypnotics or anxiolytics, muscle relaxants or antihistamines. Table 6.4 on the next page (*Reported and Identified Exposures by Specific Drugs Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020*) provides a summary of the different agents reported or identified among those with acute opioid intoxication-overdose.

**Table 6.3:** Top 20 Most Common Drug Combinations or Single Agent Exposures Identified on the Toxicological Screening of the Cook County Medical Examiner Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020

NUMBER OF CASES	PERCENT CASES	NUMBER OF DRUGS INVOLVED	HEROIN	FENTANYL	ACETYL FENTANYL	4-ANPP	UNSPECIFIED OPIOIDS	ETHANOL	COCAINE
110	6.98	1	●						
85	5.39	2	●	●					
56	3.55	1		●					
52	3.30	2	●						●
49	3.11	2	●					●	
34	2.16	2		●					●
33	2.09	3	●	●		●			
30	1.90	3	●	●					●
27	1.71	2					●		●
24	1.52	1					●		
24	1.52	3	●	●	●				
22	1.40	2		●	●				
20	1.27	2		●		●			
20	1.27	3	●	●				●	
20	1.27	4	●	●	●				●
17	1.08	3	●					●	●



**Table 6.4:** Reported and Identified Exposures by Specific Drugs Among Suburban Cook County Residents with Acute Opioid Exposure-Overdose, 2016 to June 2020

SPECIFIC AGENTS IDENTIFIED ON TOXICOLOGICAL SCREENING OR REPORTED BY PATIENT	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
<b>Opioids</b>				
Opium	0 (0.0%)	51 (0.8%)	76 (1.1%)	n/a (n/a)
Heroin	193 (10.3%)	4397 (71.7%)	1010 (14.2%)	868 (55.1%)
Methadone	49 (2.6%)	66 (1.1%)	124 (1.7%)	100 (6.3%)
Fentanyl Analogs/Metabolites	19 (1.0%)	n/a (n/a)	n/a (n/a)	993 (63.0%)
Fentanyl	19 (1.0%)	n/a (n/a)	n/a (n/a)	990 (62.8%)
Acetylfentanyl (Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	276 (17.5%)
4-ANPP (4-Anilino-N-phenethylpiperidine)	n/a (n/a)	n/a (n/a)	n/a (n/a)	359 (22.8%)
Butyryl Fentanyl (Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	3 (0.2%)
Carfentanyl (Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	16 (1.0%)
Cyclopropyl Fentanyl (Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	42 (2.7%)
4-Fluoroisobutyryl Fentanyl (4-FIBF)	n/a (n/a)	n/a (n/a)	n/a (n/a)	4 (0.3%)
2-Furanyl Fentanyl (Fu-F; Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	69 (4.4%)
Methoxyacetyl Fentanyl (Analog)	n/a (n/a)	n/a (n/a)	n/a (n/a)	10 (0.6%)
Norfentanyl (Metabolite)	n/a (n/a)	n/a (n/a)	n/a (n/a)	5 (0.3%)
Para-Fluorobutyryl Fentanyl (4-FBF)	n/a (n/a)	n/a (n/a)	n/a (n/a)	3 (0.2%)
Valerylfentanyl	n/a (n/a)	n/a (n/a)	n/a (n/a)	8 (0.5%)
Hydromorphone	32 (1.7%)	n/a (n/a)	n/a (n/a)	37 (2.3%)
Morphine	63 (3.4%)	n/a (n/a)	n/a (n/a)	36 (2.3%)
Oxycodone	6 (0.3%)	n/a (n/a)	n/a (n/a)	13 (0.8%)
Oxycodone	155 (8.2%)	n/a (n/a)	n/a (n/a)	48 (3.0%)
Hydrocodone	852 (45.3%)	n/a (n/a)	n/a (n/a)	154 (9.8%)
Butorphanol	2 (0.1%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Propoxyphene	1 (0.1%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Codeine	194 (10.3%)	n/a (n/a)	n/a (n/a)	25 (1.6%)
Buprenorphine	48 (2.6%)	n/a (n/a)	n/a (n/a)	15 (1.0%)
Meperidine	0 (0.0%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Nalbuphine	0 (0.0%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Tramadol	335 (17.8%)	n/a (n/a)	n/a (n/a)	49 (3.1%)
Tarapentadol	6 (0.3%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Pentazocine	0 (0.0%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Dihydrocodeine	0 (0.0%)	0 (0.0%)	0 (0.0%)	11 (0.7%)
Levomethorphan	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Levorphanol	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.1%)
U-47700 (Pink)	0 (0.0%)	0 (0.0%)	0 (0.0%)	17 (1.1%)
U-49900 (trans-3,4-dichloro-N-[2-(diethylamino)cyclohexyl]-N-methyl-benzamide)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other/Unspecified Opioids	36 (1.9%)	1639 (26.7%)	5936 (83.6%)	95 (6.0%)

(continued)



SPECIFIC AGENTS IDENTIFIED ON TOXICOLOGICAL SCREENING OR REPORTED BY PATIENT	ILLINOIS POISON CENTER (N=1879)	HOSPITAL OUTPATIENT/ED (N=6135)	HOSPITAL INPATIENT (N=7103)	COOK COUNTY MEDICAL EXAMINER (N=1576)
<b>Cannabinoids</b>	29 (1.5%)	155 (2.5%)	370 (5.2%)	0 (0.0%)
<b>Stimulants</b>	74 (3.9%)	211 (3.4%)	456 (6.4%)	548 (34.8%)
Cocaine	53 (2.8%)	60 (1.0%)	150 (2.1%)	479 (30.4%)
Amphetamine	21 (1.1%)	2 (0.0%)	21 (0.3%)	72 (4.6%)
Methamphetamine	1 (0.1%)	n/a (n/a)	n/a (n/a)	23 (1.5%)
Methylphenidate	2 (0.1%)	0 (0.0%)	1 (0.0%)	2 (0.1%)
Other Stimulants	1 (0.1%)	1 (0.0%)	1 (0.0%)	32 (2.0%)
Cathinone stimulant	0 (0.0%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
Mitragynine	0 (0.0%)	n/a (n/a)	n/a (n/a)	24 (1.5%)
Unspecified/Other Stimulant	0 (0.0%)	1 (0.0%)	1 (0.0%)	9 (0.6%)
<b>Ethanol</b>	0 (0.0%)	304 (5.0%)	545 (7.7%)	367 (23.3%)
<b>Hallucinogens (inc. MDMA, PCP)</b>	6 (0.3%)	5 (0.1%)	26 (0.4%)	23 (1.5%)
Amphetamine based (e.g. MDMA, MDA)	3 (0.2%)	n/a (n/a)	n/a (n/a)	6 (0.4%)
PCP	2 (0.1%)	n/a (n/a)	n/a (n/a)	15 (1.0%)
Ketamine	0 (0.0%)	n/a (n/a)	n/a (n/a)	3 (0.2%)
LSD	2 (0.1%)	n/a (n/a)	n/a (n/a)	1 (0.1%)
Tryptamines	0 (0.0%)	n/a (n/a)	n/a (n/a)	0 (0.0%)
<b>Sedative-Hypnotics and Anxiolytics</b>	426 (22.7%)	187 (3.0%)	725 (10.2%)	322 (20.4%)
Benzodiazepines	399 (21.2%)	127 (2.1%)	437 (6.2%)	265 (16.8%)
Barbiturates	3 (0.2%)	1 (0.0%)	9 (0.1%)	11 (0.7%)
Other Sedative-Hypnotics and Anxiolytics	n/a (n/a)	n/a (n/a)	n/a (n/a)	72 (4.6%)
<b>Inhalants and Other Volatile Solvents</b>	2 (0.1%)	2 (0.0%)	0 (0.0%)	1 (0.1%)
<b>Toxic Muscle Relaxants and Related Drugs</b>	106 (5.6%)	12 (0.2%)	40 (0.6%)	43 (2.7%)
Cyclobenzaprine	47 (2.5%)	0 (0.0%)	0 (0.0%)	36 (2.3%)
Metaxalone	3 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Methocarbamol	4 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Carisoprodol	7 (0.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Tizanidine	15 (0.8%)	0 (0.0%)	0 (0.0%)	8 (0.5%)
<b>Nicotine Addiction</b>	n/a (n/a)	1402 (22.9%)	1568 (22.1%)	0 (0.0%)
<b>Other Polysubstance Abuse</b>	2 (0.1%)	236 (3.8%)	256 (3.6%)	0 (0.0%)
Toxic Other Polysubstance Abuse	3 (0.2%)	7 (0.1%)	68 (1.0%)	0 (0.0%)

SECTION 7 SUMMARY

# Description of Opioid Cases Which Do Not Involve Acute Intoxication or Overdose

- Most hospital visits involving screening and treatment for substance use disorders do not involve acute intoxication of the patient at the time of intake. Cases of intoxication-overdose only represent 28.4% of all opioid related outpatient ED visits (out of 21,594 opioid related ED visits) and 24.2% of opioid related hospital admissions (out of 29,347 opioid related admissions).
- Of the 15,459 opioid related outpatient ED visits not involving acute opioid intoxication, 66.3% had a primary diagnosis for substance use disorders or related symptoms including withdrawal (n=10,251).
- Of the 22,244 opioid related inpatient admissions not involving acute opioid intoxication, 60.9% had a primary diagnosis for substance use disorders or related symptoms including withdrawal (n=13,546).
- Among the inpatient cases, 6,690 (30.1%) were admitted specifically for an inpatient drug treatment program, of which 1,678 had a concurrent diagnosis for alcohol dependency along with opioid dependency. The average treatment duration for these admissions was 4.7 days.
- Across both hospital data systems, 17.7% of outpatient ED visits and 43.7% of inpatient cases had a diagnosis for a major psychiatric condition (e.g. major depression, psychoses).
- The cumulative hospital charges to treat suburban Cook County residents for all opioid related issues between 2016-2019 was almost \$800 million USD. Approximately 80% was paid by government insurance programs or involved uninsured individuals.
- When looking at any drug related overdose deaths using the medical examiner data, there were 907 additional deaths involving drugs without detectable levels of opioids. The most common causes of non-opioid drug related deaths were from ethanol (n=728), cocaine (n=198), benzodiazepines (n=42), and amphetamines (n=19).

Crude Average Annual Hospitalization Rates per 100,000 Residents of Illinois Residents Experiencing Any Opioid Related Visit by Department of Public Health Jurisdiction, 2016 to June 2020

JURISDICTION	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT
Cook County DPH	204.1	280.1
Chicago DPH	522.9	690.3
Rest of Illinois	213.7	221.8

## SECTION 7

# Description of Opioid Cases Which Do Not Involve Acute Intoxication or Overdose

### 7.1 Summary of Non-Acute Opioid Cases Treated in the Hospital Setting

Most hospital visits involving screening and treatment for substance use disorders do not involve acute intoxication of the patient at the time of intake. While the largest proportion of intoxication-overdose cases are captured in the hospital setting, they represent only 28.4% of all opioid related outpatient ED visits (out of 21,594 opioid related ED visits) and 24.2% of opioid related hospital admissions (out of 29,347 opioid related admissions). Table 7.1 at right shows the crude annual hospitalization rates for any opioid related visit (both acute and non-acute dependency cases).

Of the 15,459 opioid related outpatient ED visits not involving acute opioid intoxication, 66.3% had a primary diagnosis for substance use disorders or related symptoms including withdrawal (n=10,251). Of the 22,244 opioid related inpatient admissions not involving acute opioid intoxication, 60.9% had a primary diagnosis for substance use disorders or related symptoms including withdrawal (n=13,546). Among the inpatient cases, 6,690 (30.1%) were admitted specifically for an inpatient drug treatment program, of which 1,678 had a concurrent diagnosis for alcohol dependency along with opioid dependency. The average treatment duration for these admissions was 4.7 days. The remaining 40% of visits and admissions involved treatment for various diseases and traumatic injuries, but all the patients were diagnosed with opioid use disorder. Unlike the cases being treated for acute intoxication-overdose, a much smaller fraction had a diagnosis of a chronic pain condition (6.7% of outpatients and 14.8% inpatients).

Across both hospital data systems, 17.7% of outpatient ED visits and 43.7% of inpatient cases had a diagnosis for a major psychiatric condition (e.g. major depression, psychoses). There were also many additional deaths that occurred in this group: n=44 of outpatient ED visits and n=283 of inpatient admissions (who died while in the hospital or were discharged to hospice care).

Most of the outpatient ED and inpatient cases were covered by a government insurance program or were uninsured

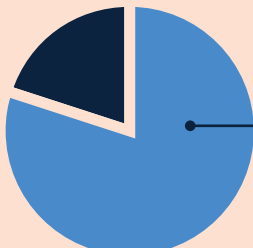
**Table 7.1:** Crude Average Annual Hospitalization Rates per 100,000 Residents of Illinois Residents Experiencing Any Opioid Related Visit by Department of Public Health Jurisdiction, 2016 to June 2020

JURISDICTION	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT
Cook County DPH	204.1	280.1
Chicago DPH	522.9	690.3
Evanston DPH	107.9	187.1
Skokie DPH	106.9	194.6
Oak Park DPH	280.6	330.3
60402*	350.7	395.6
60455*	442.4	583.7
60459*	213.5	289.5
60804*	238.6	274.6
Rest of Illinois	213.7	221.8

\*These zip codes overlap Stickney DPH

**Cumulative Hospital Charges Reach Almost \$800 Million**

The cumulative hospital charges to treat suburban Cook County residents for all opioid related issues between 2016-2019 was almost **\$800 million USD.**



Approximately **80%** was paid by government insurance programs or involved uninsured individuals.

(79.0% outpatient ED visits and 73.4% of inpatient visits). The total charges to treat individuals with a primary diagnosis for an opioid-related substance not involving acute opioid intoxication was \$60,580,922 for outpatient ED visits and \$226,189,072 for inpatient admissions. When combined with the hospital charges to treat patients for acute opioid exposures-overdoses, the cumulative hospital charges were \$793 million USD for the period of 2016-2019 among suburban Cook County residents.

## 7.2 Drug Related Deaths Not Involving Opioids

When looking at any drug related overdose deaths using the medical examiner data, there were 907 additional deaths involving drugs but no detectable levels of opioids. The most common causes of non-opioid drug related deaths were from ethanol (n=728), cocaine (n=198), benzodiazepines (n=42), and amphetamines (n=19). However, it is likely that many alcohol related diseases and cardiovascular crises caused by cocaine go undetected or do not result in an autopsy by the medical examiner.

Alcohol is the most pervasive drug leading to addiction in the U.S. and is associated with more deaths than opioids. In

**Table 7.2:** Crude Average Annual Hospitalization Rates per 100,000 Residents of Illinois Residents Experiencing Any Ethanol Related Visit by Department of Public Health Jurisdiction, 2016 to June 2020

GEOGRAPHIC REGION	HOSPITAL OUTPATIENT/ED	HOSPITAL INPATIENT	COOK COUNTY MEDICAL EXAMINER
Cook County DPH	694.7	598.4	9.4
Chicago DPH	1197.1	854.0	16.6
Evanston DPH	900.7	588.3	7.9
Skokie DPH	433.4	357.7	4.3
Oak Park DPH	762.7	516.4	8.9
Rest of Illinois	714.7	555.6	12.9

2017, alcohol was identified as a contributing cause of death in 72,558 cases (White, 2020), but this does not include many fatal injuries caused from cancer, motor vehicle collisions and violence. When looking at Illinois hospital and Cook County Medical Examiner’s Office data, mortality rates were nearly equivalent to opioids (most fatal injuries do not capture alcohol as a contributing cause or result in an autopsy) while hospital rates greatly exceeded the rates for all opioid related hospital visit (see Table 7.2 above).



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## Organized by Report Chapter

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### EXECUTIVE SUMMARY

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### SECTION 3: Temporal Patterns of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

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## SECTION 5: Description of Comorbidities, In-Hospital Care and Discharge Status of Acute Opioid Exposures-Overdoses Among Suburban Cook County Residents

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## SECTION 7: Description of Cases Which Do Not Involve Acute Intoxication or Overdose

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