

ORANGE COUNTY  
HEALTH CARE AGENCY & SHERIFF-CORONER



# DRUG & ALCOHOL MORBIDITY & MORTALITY in ORANGE COUNTY



2017

# **Drug & Alcohol Overdose Hospitalization & Death in Orange County**

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***A story map summary is available at: [Drug/Alcohol Story Map](#).***

## INTRODUCTION

According to the 2015 National Survey on Drug Use and Health (NSDUH), 66.7 million people in the United States reported binge drinking in the past month and 27.1 million people used illicit drugs or misused prescription drugs (Center for Behavioral Health Statistics and Quality, 2016). Alcohol misuse contributes to about 88,000 deaths each year in the U.S. Additionally, the rate of drug-induced overdose deaths in the U.S. has significantly increased in the past decade with an estimated 47,055 drug overdose deaths occurring in 2014 and over 60% of such deaths are related to opioid overdoses, including heroin and prescription drugs (Rudd et al., 2016). The CDC also found the lethal combination of benzodiazepines and opioids was a leading cause of overdose in the nation (CDC, 2014; Chen et al., 2014). Furthermore, it has been speculated that concurrent use of multiple substances may be related to the surge in hospitalizations and overdose deaths (CDC, 2013a; Paulozzi et al., 2011).

Substance misuse and use disorders also have serious economic consequences resulting in lost productivity, as well as criminal justice and health care expenses accumulating to more than \$400 billion annually in the U.S. (Sacks et al., 2015; National Drug Intelligence Center, 2011). In Orange County, drug- and alcohol-related hospitalization charges between 2011 and 2012 were estimated to be more than \$269 million (Health Policy, Research, and Communication, 2014). Prevention programs not only have the potential to reduce substance-related hospitalizations and/or deaths, but also provide a cost-effective intervention. The benefit-per-dollar cost ratios can range from small returns to more than \$64 for every dollar invested in prevention programs (U.S. Department of Health and Human Services, 2016).

Similar to nationwide trends, Orange County has seen a significant increase in alcohol- and drug-related overdose deaths within the last 12 years. A recent report revealed that drug and alcohol overdose deaths increased by 51% between 2000 and 2012 in Orange County (Health Policy, Research, and Communication, 2014). Drug overdose deaths increased 61% while alcohol overdose deaths increased by 41% in the same time period. Moreover, nearly half of all overdose deaths were due to accidental overdose of prescription drugs. This highlights the importance of focusing prevention efforts to address the rising opioid consumption among residents. Opioids have become the most prescribed class of medications in the U.S. with more than 289 million prescriptions written each year (Levy et al., 2015; Volkow et al., 2011).

This report is an update to HCA's 2014 Drug & Alcohol Overdose Hospitalization & Death report, wherein we examined cases between 2013 and 2015. It presents demographic information (e.g., gender, age, race/ethnicity, and geographic differences) of Orange County residents who were hospitalized and/or died as a result of substance-related overdose and examines factors that contributed to hospitalizations and overdose deaths (e.g., intent and type of substance used). These findings and profiles are intended to help guide local substance use education, prevention, and treatment efforts.

Hospitalization cases (2013-2015) were collected from the State of California Office of Statewide Health Planning and Development – Patient Discharge Data (OSHPD-PD) and were categorized according to the International Classification of Disease 9<sup>th</sup> Revision (ICD-9). Information regarding overdose deaths (2013-2015) were analyzed from two separate sources, the Death Statistical Master File (DSMF) and Coroner Data provided by the California Department of Public Health and the Orange County Sheriff's Department - Coroner Division, respectively.

## DRUG- & ALCOHOL-RELATED HOSPITALIZATIONS

Drug- and alcohol-related hospitalizations for Orange County residents between 2013 and 2015 are summarized in **Table 1** based on principal diagnosis (ICD-9 code) at discharge. The overall rate of hospitalizations for both drugs and alcohol related diagnoses, respectively, have remained level since 2011. Nearly half of the 16,396 hospitalizations (48%) were for people who exhibited symptoms associated with mental disorders due to alcohol or drug withdrawal (e.g., delirium tremens). These symptoms can occur when an individual is denied an alcohol- or drug-like substance for a significant period of time or experiences substance-induced mental disorders such as withdrawal, substance-induced psychoses, or delirium.

Roughly a quarter of these hospitalizations were for non-psychotic disorders ( $n = 3876$ , 23.6%), characterized primarily as chronic alcohol dependence syndrome or drug dependence. Among these types of disorders, alcohol was the leading contributor to hospitalizations ( $n = 1,831$ , 11.2%). Opioid dependence was the second leading cause of substance-related hospitalizations in Orange County ( $n = 980$ , 6.0%).

**Table 1.** Drug and Alcohol Related Hospitalizations for Orange County Residents (2013-2015)

Principle Diagnosis (ICD-9 Codes)	Number (2013)	Number (2014)	Number (2015)	Total (2013-2015)	Total % (2013-2015)
<b>Mental Disorders: Organic Psychotic Conditions (290-294)</b>	<b>2,332</b>	<b>2,753</b>	<b>2,785</b>	<b>7,870</b>	<b>48.0%</b>
Alcohol-Induced Mental Disorders (291: e.g., Delirium tremens, alcohol withdrawal)	1,497	1,862	1,994	5,353	32.6%
Drug-Induced Mental Disorders (292: drug withdrawal)	835	891	791	2,517	15.4%
<b>Neurotic Disorders, Personality Disorders, &amp; other Non-Psychotic Mental Disorders (300-316)</b>	<b>1,487</b>	<b>1,208</b>	<b>1,181</b>	<b>3,876</b>	<b>23.6%</b>
Alcohol Dependence Syndrome (303: alcohol intoxication)	759	587	485	1,831	11.2%
<i>Drug Dependence (304.0 – 304.9)</i>	<i>523</i>	<i>420</i>	<i>505</i>	<i>1,448</i>	<i>8.8%</i>
Opioid Dependence (304.0)	340	280	360	980	6.0%
Sedative, Hypnotic, Anxiolytic Dependence (304.1; Barbiturate & Non-Barb)	41	33	53	127	0.8%
Cocaine Dependence (304.2)	3	2	6	11	0.1%
Cannabis Dependence (304.3)	14	5	1	20	0.1%
Amphetamine & Other Psychostimulant Dependence (304.4)	45	28	20	93	0.6%
Other Drug Dependence (304.6: e.g., glue sniffing, inhalants)	0	0	0	0	0.0%
Combinations of Opioid Type Drug with any other drugs (304.7)	69	65	54	188	1.1%
Combinations of Drug Dependence (Excluding Opioids) (304.8)	9	6	11	26	0.2%
Hallucinogen Dependence-Continuous (304.5)	1	0	0	1	0.01%
Unspecified Drug Dependence (304.9)	1	1	0	2	0.0%
<i>Non-Dependent Abuse (305.0 – 305.9)</i>	<i>205</i>	<i>201</i>	<i>191</i>	<i>597</i>	<i>3.6%</i>
Non-Dependent Abuse of Alcohol (305.0)	148	134	118	400	2.4%
Non-Dependent Abuse of Cannabis (305.2)	11	6	6	23	0.1%
Non-Dependent Abuse Hallucinogen (305.3)	0	0	0	0	0.00%
Non-Dependent Barbiturate Abuse (305.4)	0	3	6	9	0.1%
Non-Dependent Abuse Opioid (305.5)	10	11	11	32	0.2%
Non-Dependent Abuse Cocaine (305.6)		6	1	7	0.04%
Non-Dependent Abuse Amphetamine (305.7)	22	29	40	91	0.6%
Non-Dependent Abuse Antidepressant (305.8)	0	1	0	1	0.01%
Non-Dependent Abuse of Other, Mixed or Unspec. Drugs (305.9)	14	11	9	34	0.2%

Poisonings by drugs, medicinals, and other biological substances accounted for 26.3% ( $n = 4,319$ ) of hospitalizations that were classified as accidental overdoses, which is described as any case where the wrong substance was given or taken in error (**Table 1 Cont.**). The majority of these cases involved benzodiazepine tranquilizers ( $n = 1,397$ ; 8.5%) or opioid substances ( $n = 1,542$ , 9.4%). A smaller percentage of hospitalizations were due to the toxic effects of non-medicinal substances (2%) or other adverse reactions (0.1%).

**Table 1 (Continued).** Drug and Alcohol Related Hospitalizations for Orange County Residents (2013-2015)

Principle Diagnosis (ICD-9 Codes)	Number (2013)	Number (2014)	Number (2015)	Total (2013-2015)	Total % (2013-2015)
<b>Poisoning by Drugs, Medicinals and Biological Substances (960-979; overdose)</b>	<b>1,419</b>	<b>1,481</b>	<b>1,419</b>	<b>4,319</b>	<b>26.3%</b>
Poisoning by Medicinal Drugs (960-964) (e.g., antibiotics, insulin)	113	123	130	366	2.2%
Poisoning by Opium (965.00)	92	113	96	301	1.8%
Poisoning by Heroin (965.01)	78	70	67	215	1.3%
Poisoning by Methadone (965.02)	35	35	22	92	0.6%
Poisoning by Other Narcotics (965.09; Codeine, Morphine)	121	116	137	374	2.3%
Poisoning by Salicylates (965.1; e.g., aspirin)	37	25	23	85	0.5%
Poisoning by Aromatic Analgesics (965.4; e.g., acetaminophen)	160	154	161	475	2.9%
Poisoning by Propionic Acid Derivatives (965.61; e.g., ibuprofen)	22	14	14	50	0.3%
Poisoning by Other Antirheumatics (965.69; gold salts)	0	0	0	0	0.00%
Poisoning by Non-Narcotic Analgesics (965.7)	1	0	0	1	0.0%
Poisoning by Analgesics/Antipyretics (965.8; Pentazocine or synthetic opioid)	7	11	5	23	0.1%
Poisoning by Unspecified Analgesic/Antipyretic (965.9)	0	2	5	7	0.04%
Poisoning by Anticonvulsants & Anti-Parkinson Drugs (966)	39	48	40	127	0.8%
Poisoning by Sedative and Hypnotics (967)	75	85	46	206	1.3%
Poisoning by other CNS Depressants & Anesthetics (968)	30	29	27	86	0.5%
Poisoning by Psychotropic Agents (969; e.g., Benzodiazepine tranquilizers)	472	472	453	1,397	8.5%
Poisoning by CNS Stimulants (970; e.g., opiate antagonists naloxone)	9	11	18	38	0.2%
Poisoning by Other Medicinal Medicines (971 - 979)	128	173	175	476	2.9%
<b>Toxic Effects of Substances Chiefly Non-Medicinal as to Source (980-989)</b>	<b>107</b>	<b>110</b>	<b>91</b>	<b>308</b>	<b>1.9%</b>
Toxic Effect of Alcohol (980; ethyl alcohol, methyl alcohol)	36	46	26	108	0.7%
Toxic Effect of Other substances (981-989)	71	64	65	200	1.2%
<b>Other and Unspecified Effects of External Causes (990-995)</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>23</b>	<b>0.1%</b>
Drug Allergy (995.27)	2	2	4	8	0.05%
Adverse Effects of Med/Biological Substance NEC/NOS (995.29)	4	10	1	15	0.1%
<b>Total</b>	<b>5,351</b>	<b>5,564</b>	<b>5,481</b>	<b>16,396</b>	<b>99.9%</b>



## DEMOGRAPHIC DIFFERENCES

### GENDER

On average, about 5,500 residents are hospitalized for a drug and/or alcohol related issues each year. Nearly 6 in 10 (58.1%) hospitalizations were among males ( $n = 9,532$ ), while 42% ( $n = 6,863$ ) of those who were hospitalized were female (**Table 2**). Males had an average hospitalization rate of 20.2 per 10,000, which was 36% higher than that of females at 14.8 per 10,000. The rate of drug- and alcohol-related hospitalizations has remained relatively level for both males and females over the past several years.

**Table 2.** Gender of Drug & Alcohol-Related Hospitalization Patients (2013 - 2015)

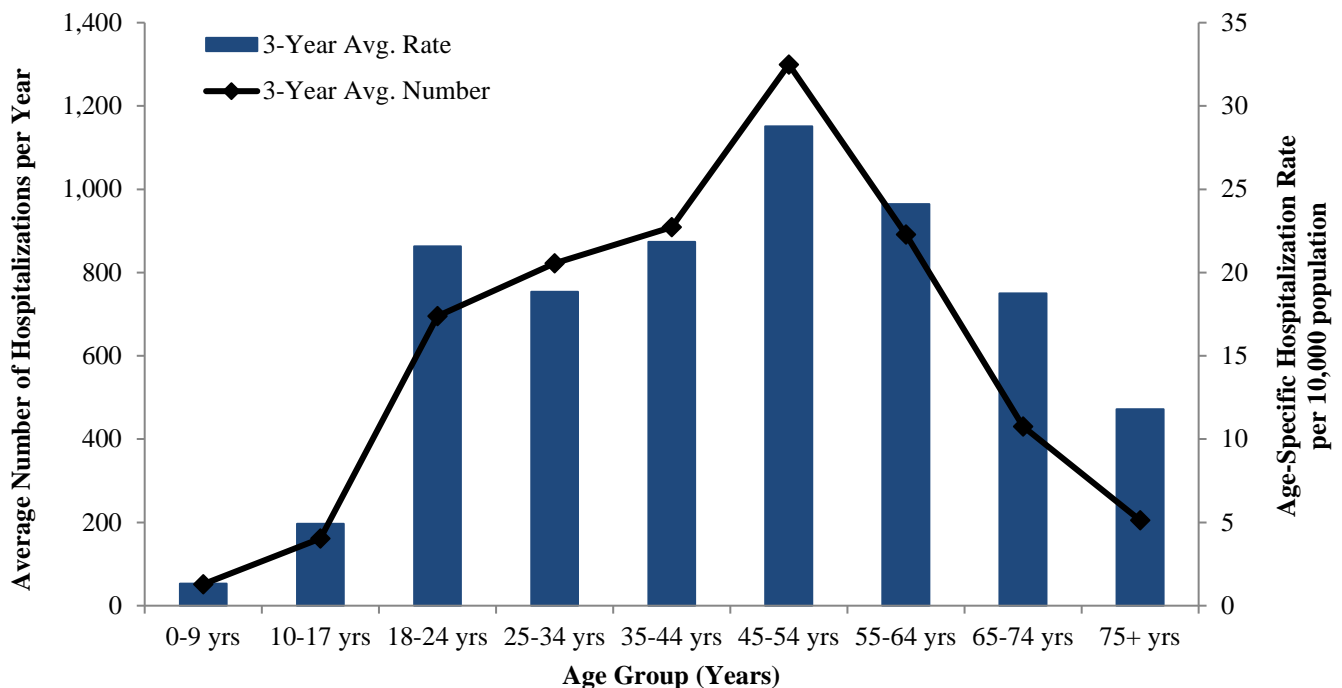
	Number (2013)	Number (2014)	Number (2015)	Total Number	3-Year Average	3-Yr Avg. Rate (per 10,000)
Female	2,285	2,347	2,231	6,863	2,288	14.8
Male	3,065	3,217	3,250	9,532	3,177	20.2
<b>Total</b>	<b>5,350*</b>	<b>5,564</b>	<b>5,481</b>	<b>16,395</b>	<b>5,465</b>	<b>17.5</b>

\*Note: 1 unidentified gender patient

### AGE GROUPS

Adults 25 to 64 years of age accounted for 72% of all drug- and alcohol-related hospitalizations. The highest number and rate of hospitalizations were for individuals between 45-54 years old at 29.4 (per 10,000) followed by 55-64 year olds at 24.1 per 10,000 (**Figure 1**). The young (<18 years) and elderly (>64 years) had lower rates than the rest of the age groups.

**Figure 1.** Number and Age-Specific Rates of Hospitalizations for Drug and Alcohol (2013-2015)

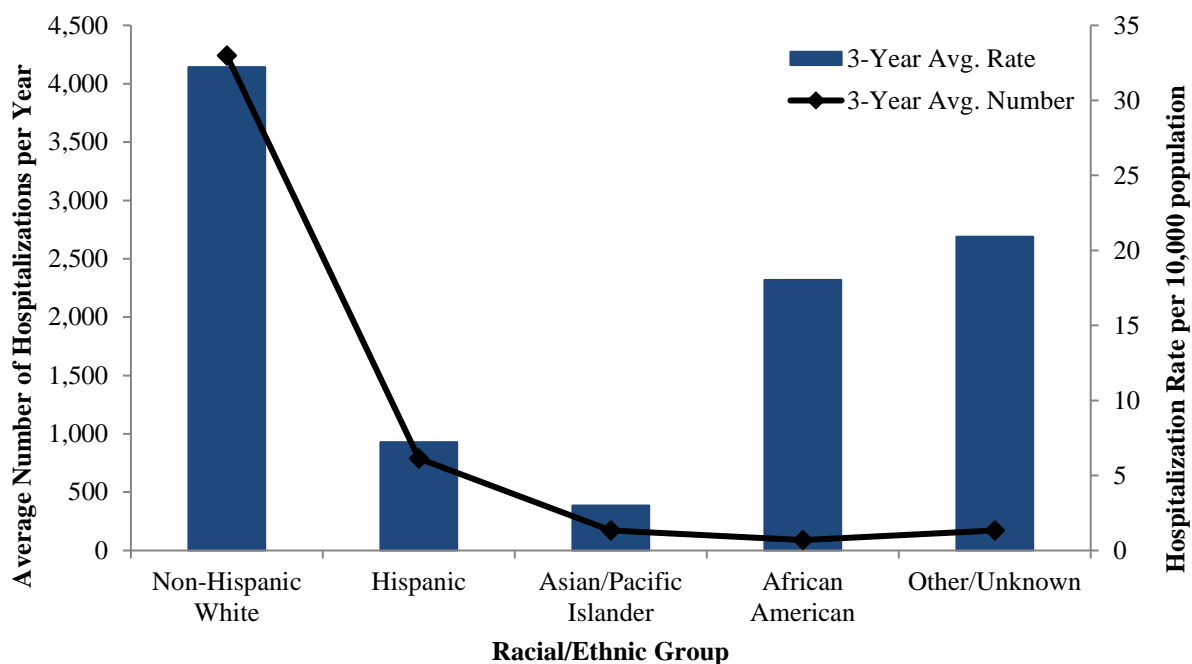


## RACE & ETHNICITY

The overwhelming majority (78%) of drug- and alcohol-related hospitalizations were among Non-Hispanic Whites ( $n = 12,724$ ), followed by Hispanics at 14% ( $n = 2,369$ ), Asian/Pacific Islanders at 3% ( $n = 518$ ), and African Americans at 2% ( $n = 268$ ).

As shown in **Figure 2**, Non-Hispanic Whites also had the highest number and rate of hospitalizations for drug- and alcohol-related issues at 32.2 (per 10,000 population). African Americans had the second highest rate at 18.0, albeit a very small number of cases, followed by Hispanics at 7.2 and Asian/Pacific Islanders at 3.0 (per 10,000 population). The rate of African American hospitalization should be interpreted with caution due to the small population size among this group.

**Figure 2.** Drug- and Alcohol-Related Hospitalization Rates by Racial/Ethnic Group (2013-2015)



## GEOGRAPHY

The geographic distribution for drug- and alcohol-related hospitalizations between 2013 and 2015 are presented in **Table 3** and **Map 1** on the following page. Slightly less than half (46%,  $n = 19$ ) of Orange County's cities/areas had a hospitalization rate higher than the county-wide rate of 17.5 per 10,000 residents. Importantly, those cities with the highest rates tended to be located in the southern and coastal cities of the County.

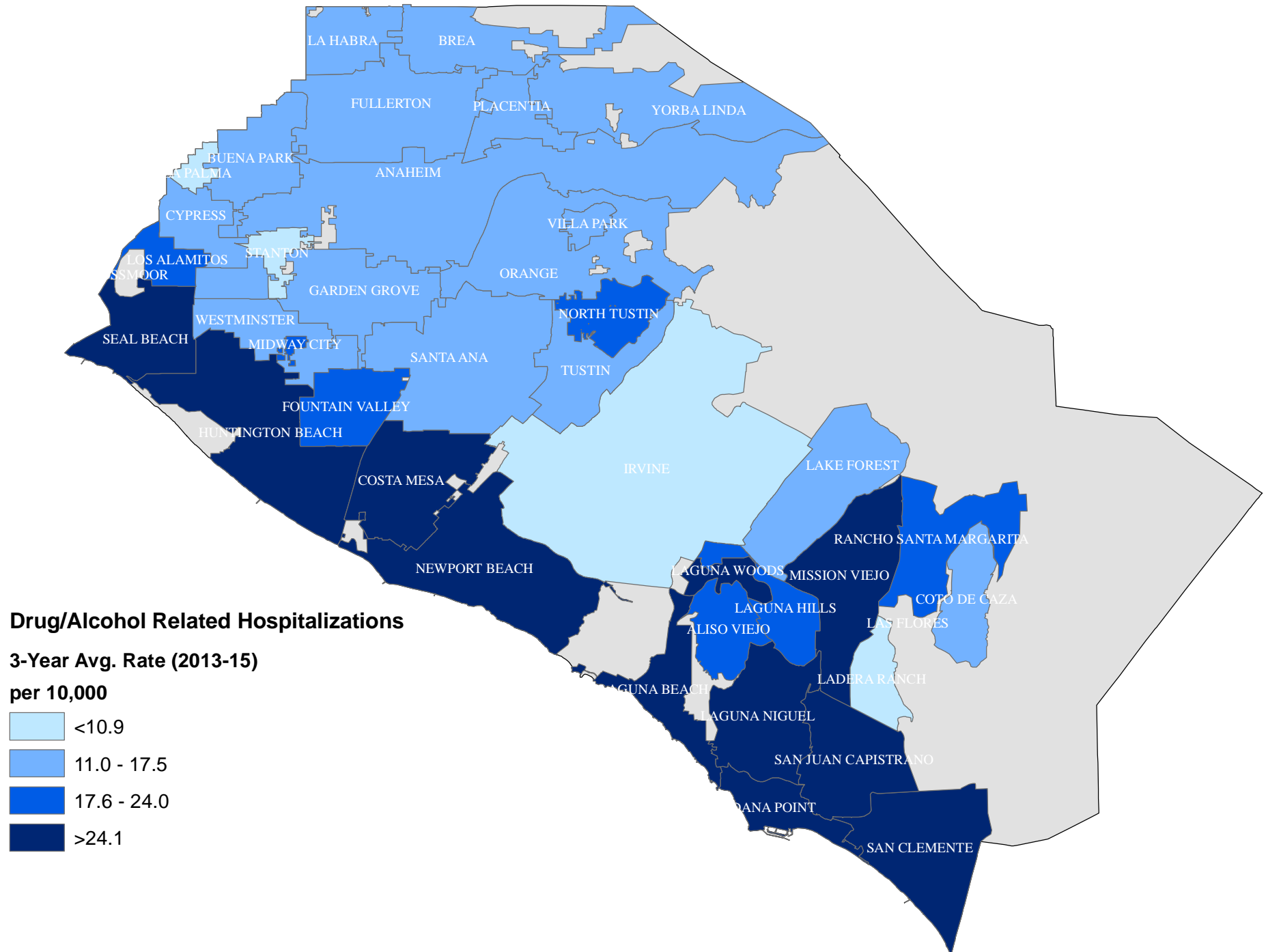


**Table 3.** Drug and Alcohol Related Hospitalization Number and Rates by City/Area (2013-2015)

City of Residence	2013	2014	2015	Total	3-Yr. Avg. No.	Population	3-Yr. Avg. Rate per 10,000	95% Confidence Interval	
DANA POINT	131	159	166	456	152.0	34,116	<b>44.6</b>	37.8	52.2
LAGUNA BEACH	107	107	95	309	103.0	23,341	<b>44.1</b>	36.0	53.5
LAGUNA WOODS	65	74	55	194	64.7	16,415	<b>39.4</b>	30.3	50.1
SAN CLEMENTE	234	209	206	649	216.3	65,326	<b>33.1</b>	28.8	37.8
COSTA MESA	330	341	366	1037	345.7	112,784	<b>30.6</b>	27.5	34.0
SAN JUAN CAPISTRANO	103	113	114	330	110.0	36,282	<b>30.3</b>	24.9	36.5
LAGUNA NIGUEL	197	168	163	528	176.0	65,448	<b>26.9</b>	23.1	31.2
HUNTINGTON BEACH	528	531	471	1530	510.0	200,809	<b>25.4</b>	23.2	27.7
NEWPORT BEACH	220	212	220	652	217.3	87,266	<b>24.9</b>	21.7	28.4
SEAL BEACH	55	44	84	183	61.0	24,662	<b>24.7</b>	18.9	31.8
MISSION VIEJO	216	273	213	702	234.0	97,209	<b>24.1</b>	21.1	27.4
SILVERADO CANYON	3	1	10	14	4.7	1,945	<b>24.0</b>	6.9	56.3
MIDWAY CITY	15	17	26	58	19.3	8,724	<b>22.2</b>	13.1	34.0
LOS ALAMITOS	43	56	47	146	48.7	22,505	<b>21.6</b>	15.9	28.5
LAGUNA HILLS	55	60	80	195	65.0	30,972	<b>21.0</b>	16.2	26.7
ALISO VIEJO	104	106	92	302	100.7	50,231	<b>20.0</b>	16.3	24.3
RANCHO SANTA MARGARITA	91	89	111	291	97.0	49,359	<b>19.7</b>	15.9	24.0
NORTH TUSTIN	86	86	77	249	83.0	46,788	<b>17.7</b>	14.1	22.0
FOUNTAIN VALLEY	106	109	86	301	100.3	57,010	<b>17.6</b>	14.3	21.3
<b>ORANGE COUNTY</b>	<b>5,350</b>	<b>5,564</b>	<b>5,481</b>	<b>16,395</b>	<b>5,465.0</b>	<b>3,118,717</b>	<b>17.5</b>	<b>17.1</b>	<b>18.0</b>
COTO DE CAZA	53	63	58	174	58.0	33,438	<b>17.3</b>	13.2	22.4
ORANGE	240	228	245	713	237.7	139,812	<b>17.0</b>	14.9	19.3
YORBA LINDA	127	94	108	329	109.7	67,826	<b>16.2</b>	13.3	19.5
LAKE FOREST	130	135	116	381	127.0	80,148	<b>15.8</b>	13.2	18.9
ANAHEIM	489	572	554	1615	538.3	346,997	<b>15.5</b>	14.2	16.9
WESTMINSTER	126	154	135	415	138.3	92,068	<b>15.0</b>	12.6	17.7
PLACENTIA	67	73	95	235	78.3	52,397	<b>14.9</b>	11.8	18.6
BREA	63	58	64	185	61.7	41,508	<b>14.9</b>	11.3	19.0
TUSTIN	108	117	133	358	119.3	80,621	<b>14.8</b>	12.2	17.7
CYPRESS	74	62	79	215	71.7	49,240	<b>14.6</b>	11.4	18.3
VILLA PARK	10	9	7	26	8.7	5,968	<b>14.5</b>	6.3	27.5
FULLERTON	197	200	172	569	189.7	139,677	<b>13.6</b>	11.7	15.6
LA HABRA	79	89	63	231	77.0	62,066	<b>12.4</b>	9.8	15.5
SANTA ANA	389	403	415	1207	402.3	334,909	<b>12.0</b>	10.9	13.2
GARDEN GROVE	202	196	223	621	207.0	175,078	<b>11.8</b>	10.3	13.5
BUENA PARK	91	106	89	286	95.3	83,105	<b>11.5</b>	9.2	14.0
LADERA RANCH	32	43	21	96	32.0	29,249	<b>10.9</b>	7.5	15.4
STANTON	42	36	49	127	42.3	38,719	<b>10.9</b>	7.8	14.7
LA PALMA	13	19	14	46	15.3	15,911	<b>9.6</b>	5.3	15.5
IRVINE	211	234	233	678	226.0	248,531	<b>9.1</b>	7.9	10.4
TRABUCO CANYON	3	2	3	8	2.7	33,438	<b>0.8</b>	0.1	2.4
Unincorporated/Unknown	1	2	0	3	1.0				



# Map 1: Drug & Alcohol Related Hospitalizations by City (2013-2015)



## HOSPITALIZATION CHARGES & LENGTH OF STAY

As summarized in **Table 4**, the total number of drug- and alcohol-related hospitalizations between 2013 and 2015 ( $N = 16,395$ ) resulted in nearly 70,000 hospital bed-days, with the average length of stay being 4.3 days. On average, each hospitalization stay resulted in over \$26,000 in charges. During this three-year period, total hospitalization charges equaled almost \$430 million.

**Table 4.** Drug- and Alcohol-Related Hospitalization Charges and Length of Stay (2013-2015)

Total Number of Hospitalizations	16,395
Total Number of Bed-Days	69,930
Average Length of Stay (in Days)	4.3
Total Charges	\$429,927,013
Average Charge per Admission	\$ 26,223

## PATIENT DISPOSITION

The majority of patients admitted to the hospital for drug- and alcohol-related problems had a routine discharge to their place of residence (69%), as shown in **Table 5**. A smaller percentage of patients were transferred to acute care facilities at another hospital or some other inpatient care (15%). One in ten left the hospital against medical advice (10%) and a small percentage died after being admitted to the hospital ( $n = 86$ , 0.5%).

**Table 5.** Patient Disposition for Drug- and Alcohol-Related Hospitalizations (2013-2015)

Disposition	3-Yr Avg No.	Total	%Total
Routine (home)	3,793.3	11,380	69.4%
Left Against Medical Advice	544.7	1,634	10.0%
Other Care (not SN/IC) at Another Hospital	350.0	1,050	6.4%
Home Health Service	184.7	554	3.4%
Skilled Nursing/Intermediate Care (SN/IC) at Another Facility	172.0	516	3.1%
Acute Care at Another Hospital	116.7	350	2.1%
Other Care within the Admitting Hospital	111.7	335	2.0%
Residential Care Facility	90.0	270	1.6%
Prison/Jail	42.7	128	0.8%
Died	28.7	86	0.5%
Acute Care within the Admitting Hospital	15.3	46	0.3%
Other	15.3	46	0.3%
<b>Total</b>	<b>5,465.0</b>	<b>16,395</b>	<b>100%</b>

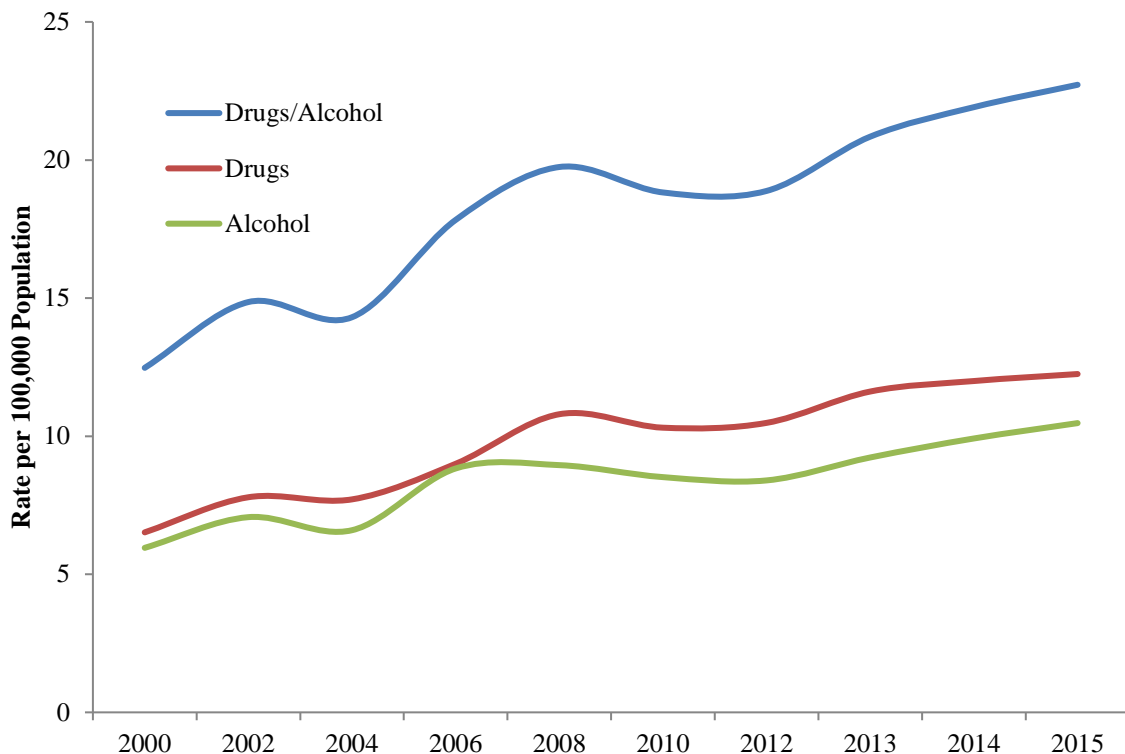
## DRUG- & ALCOHOL-RELATED DEATHS: MASTER DEATH FILE & CORONER DATA

This portion of the report used data from the State Death Statistical Master File (DSMF) and the Orange County Sheriff's Department, Coroner Division to examine all drug- and alcohol-related overdose deaths in the County. The data collected from the Coroner provided an additional level of detail regarding the decedents' cause of death that is not typically documented in the DSMF. Specifically, this set of data described the type of drug and alcohol combinations used that contributed to a decedents' death, as well as whether or not the substances used were illicit or prescription drugs.

### STATE DEATH STATISTICAL MASTER FILE

The annual drug- and alcohol-related death rates for Orange County residents between 2000 and 2015 are summarized in **Figure 3**. Overall, the rate of drug overdose deaths is similar to but slightly higher than the rate of alcohol deaths, with drug-related overdose deaths outnumbering alcohol-related overdoses in more recent years. More specifically, the rate of all drug and alcohol overdose deaths combined has increased 82% in the last 16 years, from 12.5 per 100,000 in 2000 to 22.7 per 100,000 in 2015. Similarly, the rate of all drug overdose deaths has increased 88% (6.5 vs. 12.3 per 100,000), while all alcohol related-deaths increased by 76% during this time period (6.0 vs. 10.5 per 100,000).

**Figure 3.** Drug and Alcohol Related Death Rates (2000-2015)



## ICD-10 CODES: MECHANISMS FOR DRUG USE

In the DSMF, drug and alcohol overdoses were defined by the underlying cause of death as classified by the *International Classification of Diseases 10<sup>th</sup> Revision* (ICD-10). As shown in **Table 6** on the following page, deaths due to poisoning were identified with the codes X40-X45, X60-X65, and Y10-Y15 (i.e., accidental, intentional, or undetermined). Codes F10.0-F19.9 correspond to mental and behavioral disorders related to the abuse of drug or alcohol substances. Finally, the codes I42.6 and K70.0-K70.9 describe liver diseases and other organ complications due to chronic alcohol abuse.

There were 2,047 drug- and alcohol-related overdose deaths recorded in the DSMF between 2013 and 2015 for all Orange County residents (**Table 6**). The majority of overdose deaths were due to poisoning by drugs, medicinals, and other biological substances ( $n = 1,162$ , 56.8%). Of these 1,162 cases, a large percentage of individuals overdosed after consuming drugs classified as *other drugs and medications*, which typically included cases of poly-drug use<sup>1</sup>. A small number and proportion of overdose deaths were attributed to mental or behavioral conditions caused by drug and alcohol abuse ( $n = 113$ , 5.5%). Almost four in ten of the overdose deaths were due to chronic liver disease(s) or diseases of other organs such as the heart ( $n = 772$ , 37.7%). Of all drug- and alcohol-related deaths included in this report, the top five leading causes of death included:

1. Alcoholic cirrhosis of the liver ( $n = 595$ , 29.1%).
2. Accidental overdose from other drugs and medications (e.g., poly-drug use;  $n = 526$ , 25.7%).
3. Accidental overdose from narcotics and psychodysleptics drugs (e.g., opioids, heroin, cocaine;  $n = 163$ , 8.0%).
4. Accidental overdose from sedatives and psychotropic drugs (e.g., antidepressants, benzodiazepines;  $n = 161$ , 7.9%).
5. Intentional overdose from other drugs and medications (e.g., poly-drug use;  $n = 149$ , 7.3%).

Drug use intent was determined among all cases of poisonings by drugs, medicinals, and other biological substances. Accidental overdoses were the most common cause of death when examining instances of poisonings by a prescription, illicit, or alcohol substance. Three-quarters ( $n = 918$ , 75%) of all poisoning overdose deaths were accidental, while 22% ( $n = 275$ ) were intentional and in 3% ( $n = 33$ ) of cases the cause could not be determined. It should also be noted that, in some cases, these particular types of drugs were consumed with other classes of illicit or prescription substances, as well as alcohol.



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<sup>1</sup> Poly-drug is defined as the use of multiple substances at one time including, but not limited to, opioids, benzodiazepines, antidepressants, alcohol, etc.

**Table 6.** ICD-10 Codes Categorizing Drug and Alcohol Overdose Deaths (2013-2015)

ICD-10 Code	Cause of Death	Number (2013)	Number (2014)	Number (2015)	Total (2013-2015)	Total %
<b>Mental and Behavioral Disorders due to Drug or Alcohol Consumption (F101-F199)</b>		<b>37</b>	<b>36</b>	<b>40</b>	<b>113</b>	<b>5.5%</b>
F10.1	Alcohol – harmful use	21	13	10	44	2.1%
F10.2	Alcohol – dependence syndrome	9	15	18	42	2.1%
F10.4	Alcohol – withdrawal state with delirium	-	-	-	0	0.0%
F10.6	Alcohol – amnesic syndrome	-	-	-	0	0.0%
F10.7	Alcohol – residual and late-onset psychotic disorder	-	-	1	1	0.0%
F10.9	Alcohol – unspecified mental and behavioral disorders	1	-	1	2	0.1%
F11.1	Opioid use – harmful use	2	-	2	4	0.2%
F11.9	Opioid use - unspecified mental and behavioral disorders	-	-	1	1	0.0%
F15.1	Other stimulants - harmful use	-	1	2	3	0.1%
F15.9	Other stimulants - unspecified mental and behavioral disorders	-	1	1	2	0.1%
F191	Multiple or psychoactive substances – harmful use	3	5	1	9	0.4%
F19.2	Multiple or psychoactive substances - dependence syndrome	-	-	1	1	0.0%
F19.9	Multiple or psychoactive substances – unspecified mental & behavioral disorders	1	1	2	4	0.2%
<b>Organ Complications Due to Alcohol Consumption (I30-I52 and K70-K77)</b>		<b>234</b>	<b>260</b>	<b>278</b>	<b>772</b>	<b>37.7%</b>
I426	Alcoholic cardiomyopathy	4	5	5	14	0.7%
K700	Liver disease – alcoholic fatty liver	4	5	8	17	0.8%
K701	Liver disease – alcoholic hepatitis	5	5	11	21	1.0%
K703	Liver disease – alcoholic cirrhosis of liver	180	193	222	595	29.1%
K704	Liver disease – alcoholic hepatic failure	20	14	14	48	2.3%
K709	Liver disease – alcoholic liver disease, unspecified	21	38	18	77	3.8%
<b>Poisoning by Drugs, Medicinal, and Biological Substances (X40-X45, X60-X65, and Y10-Y15)</b>		<b>375</b>	<b>389</b>	<b>398</b>	<b>1,162</b>	<b>56.8%</b>
<i>Sedatives &amp; Psychotropics (e.g., Benzodiazepines, Barbiturates, etc.)</i>		<i>59</i>	<i>63</i>	<i>78</i>	<i>200</i>	<i>9.8%</i>
X41	Accidental	48	46	67	161	7.9%
X61	Intentional	10	16	7	33	1.6%
Y11	Undetermined	1	1	4	6	0.3%
<i>Narcotics &amp; Psychodysleptics (e.g., Cocaine, Heroin, Methadone, Opioids)</i>		<i>58</i>	<i>67</i>	<i>63</i>	<i>188</i>	<i>9.2%</i>
X42	Accidental	51	56	56	163	8.0%
X62	Intentional	4	10	7	21	1.0%
Y12	Undetermined	3	1	-	4	0.2%
<i>Other Drugs &amp; Medicaments (e.g., Antidepressants, Amphetamines, Antihistamines, poly-drug)</i>		<i>236</i>	<i>237</i>	<i>235</i>	<i>708</i>	<i>34.6%</i>
X44	Accidental	164	181	181	526	25.7%
X64	Intentional	62	47	40	149	7.3%
Y14	Undetermined	7	7	9	23	1.1%
X40	Accidental – nonopioid substances	1	1	1	3	0.1%
X60	Intentional poisoning - nonopioid, antipyretics, and antirheumatics	2	1	3	6	0.3%
X63	Intentional – other drugs acting on autonomic nervous system	-	-	1	1	0.0%
<i>Alcohol Substances</i>		<i>22</i>	<i>22</i>	<i>22</i>	<i>66</i>	<i>3.2%</i>
X45	Accidental	21	22	22	65	3.2%
X65	Intentional	1	-	-	1	0.0%
Y15	Undetermined	-	-	-	-	-
<b>Total</b>		<b>646</b>	<b>685</b>	<b>716</b>	<b>2,047</b>	<b>100.0%</b>

## DEMOGRAPHIC DIFFERENCES

Substance abuse has been shown to vary depending on a person's gender, age, and ethnic background (CDC, 2014; Chen et al., 2014; Mack et al, 2013; Paulozzi et al., 2011; Okie, 2010; Shah et al, 2007; Coffin, et al, 2003). Based on this, it was important to determine the demographic differences related to drug and alcohol overdose deaths in Orange County. Annual totals, averages, and three-year average rates were calculated to investigate the differences for those who overdosed between 2013 and 2015 (**Table 7**). Male residents had twice the rate of overdose deaths due to drugs and alcohol at 29.5 (per 100,000) compared to females (14.4 per 100,000).

**Table 7.** Demographic Characteristics of Drug/Alcohol Overdose Deaths (2013-2015)<sup>2</sup>

Characteristics	Narcotics & Psychodysleptics	Sedatives & Psychotropics	Other Drugs & Medicaments	Alcohol	Total (2013-15)	2014 Population <sup>3</sup>	3-Year Avg. Number	3-Year Avg. Rate per 100,000	95% Confidence Interval	
									Lower	Upper
Gender										
Male	152	134	415	667	1368	1,543,477	456.0	29.5	26.9	32.4
Female	41	66	312	260	679	1,575,240	226.3	14.4	12.5	16.3
Age Group <sup>4</sup>										
15-24	23	9	69	3	104	449,168	34.7	7.7	5.3	10.7
25-34	46	29	133	32	240	436,288	80.0	18.3	14.3	22.8
35-44	36	27	121	85	269	415,874	89.7	21.6	17.3	26.5
45-54	38	63	177	285	563	451,711	187.7	41.5	35.8	47.9
55-64	39	44	160	329	572	369,642	190.7	51.6	44.5	59.4
65-74	8	22	45	130	205	229,458	68.3	29.8	23	37.6
75+	3	6	22	63	94	173,875	31.3	18.0	12.1	25.3
Race/Ethnicity										
Non-Hispanic White	132	137	579	588	1436	1,316,680	478.7	36.4	33.2	39.8
Hispanic	39	40	101	278	458	1,094,955	152.7	13.9	11.8	16.3
Asian/Pacific Islander	9	14	25	33	81	575,281	27.0	4.7	3.1	6.8
African American	6	7	11	7	31	49,525	10.3	20.9	9.7	37.1
Other/Unknown	7	2	11	21	41	82,276	13.7	16.6	8.9	27.8
Total	193	200	727	927	2,047	3,118,718	682.3	21.9	20.3	23.6

<sup>2</sup> ‘Narcotics and Psychodysleptics’ include drugs such as opioids, heroin, methadone, and cocaine; ‘Sedatives and Psychotropics’ include benzodiazepines and barbiturates; and ‘Other Drugs and Medicaments’ include substances such as antidepressants, antihistamines, and amphetamines.

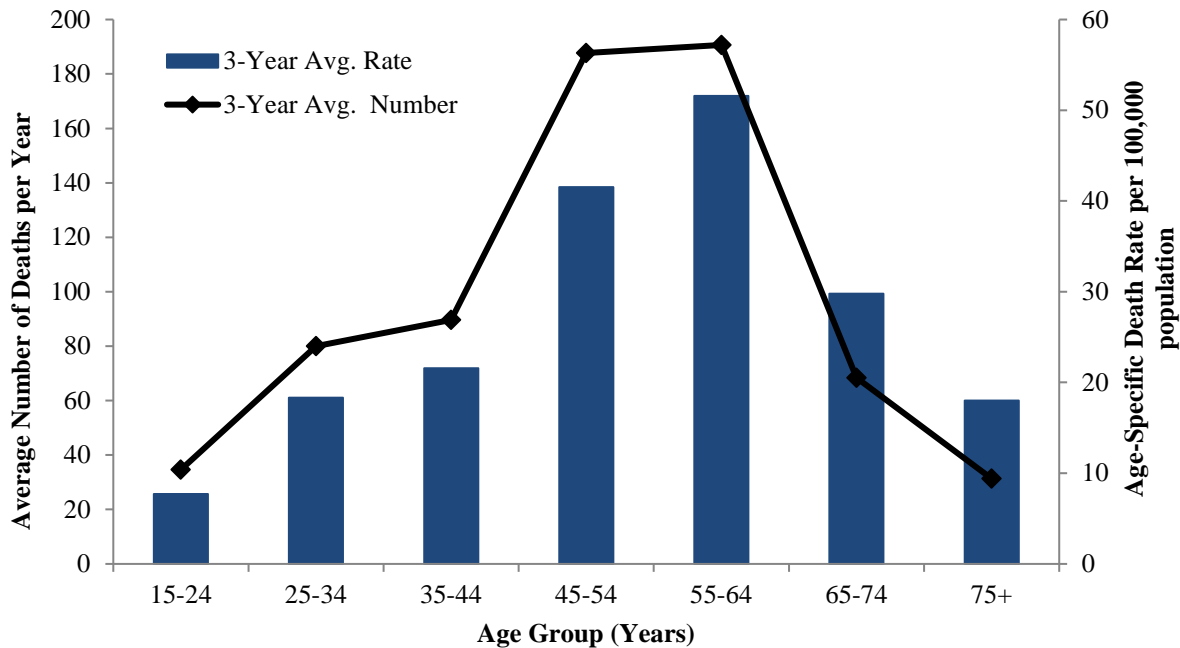
<sup>3</sup> Population numbers are from the California Department of Finance Population Projections.

<sup>4</sup> Children between the ages of 0-14 were excluded from this report because no cases of overdose deaths were reported.



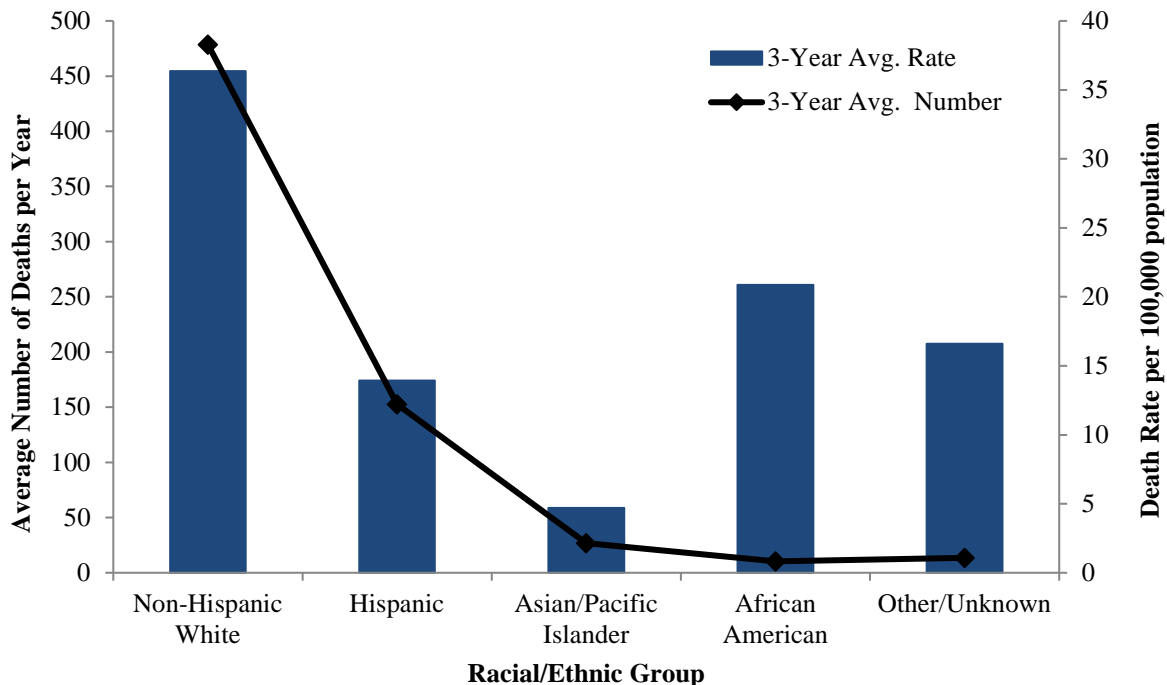
With regard to the age at which people overdosed, individuals between the ages of 55-64 (51.6 per 100,000) and 45-54 (41.5 per 100,000) years had the highest rates of overdose deaths (**Table 6** and **Figure 4**).

**Figure 4.** Average Number and Rate of Overdose Deaths by Age Group (2013-2015)



Non-Hispanic White residents had the highest rate and average number of drug- and alcohol-related overdose deaths between 2013 and 2015 (36.4 per 100,000; **Table 7** and **Figure 5**). Asian/Pacific Islander residents had the lowest rate in the County (4.7 per 100,000)

**Figure 5.** Average Number and Rate of Overdose Deaths by Racial/Ethnic Group (2013-2015)



## GEOGRAPHY

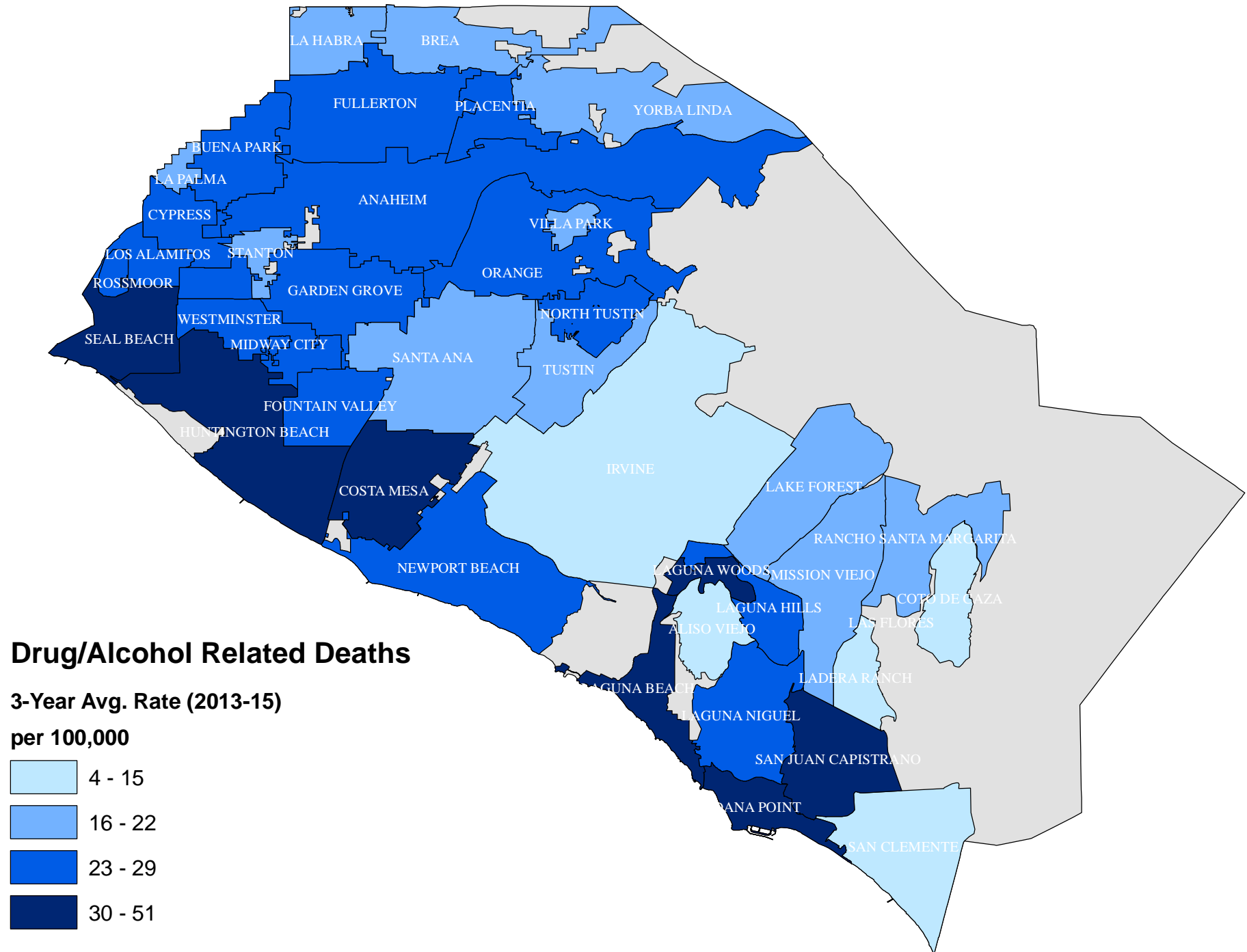
**Table 8** and **Map 2** illustrate the drug and alcohol related overdose deaths from 2013 to 2015 for all ages based on the decedents' city of residence.<sup>5</sup> Twenty-two cities/areas were above the three-year average rate for drug and alcohol deaths of 21.9 per 100,000 for Orange County. As shown in **Map 2**, cities with relatively higher overdose deaths tended to include coastal cities followed by South County locales. More specifically, Laguna Woods had the highest overdose death rate at 50.8 per 100,000, followed by Dana Point (40.1), Seal Beach (33.8), Laguna Beach (31.4), and San Juan Capistrano (31.2). Conversely, the cities/areas with the lowest three-year average mortality rates for drugs and alcohol overdoses included Irvine (7.4), Trabuco Canyon (7.0), Foothill Ranch (6.1), and Coto de Caza at 4.0 (per 100,000).

**Table 8. Drug and Alcohol Overdose Deaths by City (2013-2015)**

City of Residence	2013	2014	2015	Total	3-Yr Avg No.	2014 Population	3-Yr Avg Rate	95% Confidence Interval	
Laguna Woods	10	10	5	25	8.3	16,415	<b>50.8</b>	21.0	96.0
Dana Point	14	12	15	41	13.7	34,116	<b>40.1</b>	21.4	67.0
Seal Beach	6	6	13	25	8.3	24,662	<b>33.8</b>	14.0	63.9
Laguna Beach	4	6	12	22	7.3	23,341	<b>31.4</b>	12.1	61.8
San Juan Capistrano	13	5	16	34	11.3	36,282	<b>31.2</b>	15.1	54.2
Costa Mesa	36	36	32	104	34.7	112,784	<b>30.7</b>	21.2	42.6
Huntington Beach	52	59	69	180	60.0	200,809	<b>29.9</b>	22.8	38.5
Buena Park	21	23	26	70	23.3	83,105	<b>28.1</b>	17.5	41.5
Laguna Niguel	18	20	17	55	18.3	65,448	<b>28.0</b>	16.3	43.5
Newport Beach	20	24	27	71	23.7	87,266	<b>27.1</b>	17.2	40.2
Midway City	4	1	2	7	2.3	8,724	<b>26.7</b>	2.8	82.8
Orange	35	33	42	110	36.7	139,812	<b>26.2</b>	18.3	36.1
Laguna Hills	9	6	9	24	8.0	30,972	<b>25.8</b>	11.2	50.9
Fountain Valley	17	14	12	43	14.3	57,010	<b>25.1</b>	13.4	41.2
Placentia	12	14	11	37	12.3	52,397	<b>23.5</b>	11.8	40.0
Garden Grove	35	39	45	119	39.7	175,078	<b>22.7</b>	16.1	30.8
Anaheim	75	89	70	234	78.0	346,997	<b>22.5</b>	17.8	28.1
Cypress	12	9	12	33	11.0	49,240	<b>22.3</b>	11.2	40.0
Los Alamitos/Rossmoor	5	5	5	15	5.0	22,505	<b>22.2</b>	7.2	51.8
North Tustin	15	9	7	31	10.3	46,788	<b>22.1</b>	10.2	39.3
Westminster	17	16	28	61	20.3	92,068	<b>22.1</b>	13.3	33.5
Fullerton	25	36	31	92	30.7	139,677	<b>22.0</b>	14.8	31.1
<b>Orange County</b>	<b>646</b>	<b>685</b>	<b>716</b>	<b>2,047</b>	<b>682.3</b>	<b>3,118,717</b>	<b>21.9</b>	<b>20.3</b>	<b>23.6</b>
Santa Ana	65	76	68	209	69.7	334,909	<b>20.8</b>	16.2	26.2
Stanton	9	5	10	24	8.0	38,719	<b>20.7</b>	8.9	40.7
Rancho Santa Margarita	9	10	11	30	10.0	49,359	<b>20.3</b>	9.7	37.3
Brea	7	8	10	25	8.3	41,508	<b>20.1</b>	8.3	38.0
Lake Forest	18	17	13	48	16.0	80,148	<b>20.0</b>	11.4	32.4
Mission Viejo	15	15	26	56	18.7	97,209	<b>19.2</b>	11.4	29.9
La Palma	2	2	4	8	2.7	15,911	<b>16.8</b>	2.6	50.3
Villa Park	1	1	1	3	1.0	5,968	<b>16.8</b>	0.4	93.4
Yorba Linda	8	17	8	33	11.0	67,826	<b>16.2</b>	8.1	29.0
La Habra	6	11	12	29	9.7	62,066	<b>15.6</b>	7.2	28.6
Tustin	13	9	15	37	12.3	80,621	<b>15.3</b>	7.7	26.0
San Clemente	10	9	9	28	9.3	65,326	<b>14.3</b>	6.3	26.2
Aliso Viejo	10	8	3	21	7.0	50,231	<b>13.9</b>	5.6	28.7
Ladera Ranch	6	1	2	9	3.0	29,249	<b>10.3</b>	2.1	30.0
Irvine	16	23	16	55	18.3	248,531	<b>7.4</b>	4.3	11.4
Trabuco Canyon	3	4	0	7	2.3	33,438	<b>7.0</b>	0.7	21.6
Foothill Ranch	0	1	1	2	0.7	10,921	<b>6.1</b>	0.0	42.8
Coto de Caza	2	1	1	4	1.3	33,438	<b>4.0</b>	0.1	16.7
Unincorporated/Unknown	5	4	6	15	5.0				

<sup>5</sup> Addresses were not available for all decedents and were not included in this table or map.

## Map 2: Drug & Alcohol Related Deaths by City (2013-2015)



## CORONER INVESTIGATED DRUG & ALCOHOL OVERDOSE DEATHS

In addition to analyzing information from both, hospitalizations and the DSMF, data from the Orange County Sheriff's Department, Coroner Division were assessed. This data (n = 1,011) included the intent (i.e., accident, suicide) and specific type of drugs used (i.e., illicit drugs, prescription medication, mixtures, other drugs) in each death. To better understand the latest trends in drug- and alcohol-related overdose deaths that were investigated by the Coroner, we analyzed the the most recent data available, which included data from 2013 to 2015. Orange County residents who died out of county were not investigated by the Orange County Sheriff-Coroner, and thus were not included in the following analysis. Also, non-Orange County resident deaths that were investigated by the Coroner and deaths with no residential address were excluded from this analysis. The results in this section reflect matched cases between the DSMF and the Coroner's data (**Table 9**). Additionally, due to the Coroner's data being a subset of all drug- and alcohol-related deaths, population rates were not calculated in this section of the report. Similar to the data presented in the DSMF, drugs may have been consumed with other types of illicit or prescription substances and/or alcohol.

**Table 9.** Number of Drug and Alcohol Overdose Death Cases from the DSMF and Coroner Files

Source	Number 2013	Number 2014	Number 2015	Total 2013-2015	Average Number per Year
Master Death File	646	685	716	2,047	682
Coroner	323	340	348	1,011	337

Total number of overdose deaths increased over the course of the 3-year period with 2015 demonstrating the highest number of deaths for all drug types except mixture and other drugs. Between 2013 and 2015, the Coroner investigated 1,011 drug overdose deaths: 51.8% of cases involved a prescription drug overdose while 23.2% involved illicit substances (**Table 10**). In many cases, the decedents used a mixture of alcohol, illicit, or prescription drugs prior to overdosing (19.4%) and in 4.8% of cases, alcohol alone was the primary contributor to an individual's death.

**Table 10.** Total Number of Deaths Per Year by Type of Drug Used (2013-2015)

	Number 2013	Number 2014	Number 2015	Total 2013-2015	Total % 2013-2015
Prescription Drugs	173	175	176	524	51.8%
Illicit Drugs	78	73	84	235	23.2%
Mixture	56	73	67	196	19.4%
Alcohol	15	15	19	49	4.8%
Other	1	4	2	7	0.7%
<b>Total</b>	<b>323</b>	<b>340</b>	<b>348</b>	<b>1,011</b>	<b>100.0%</b>

### TYPE & INTENT OF DRUG USE

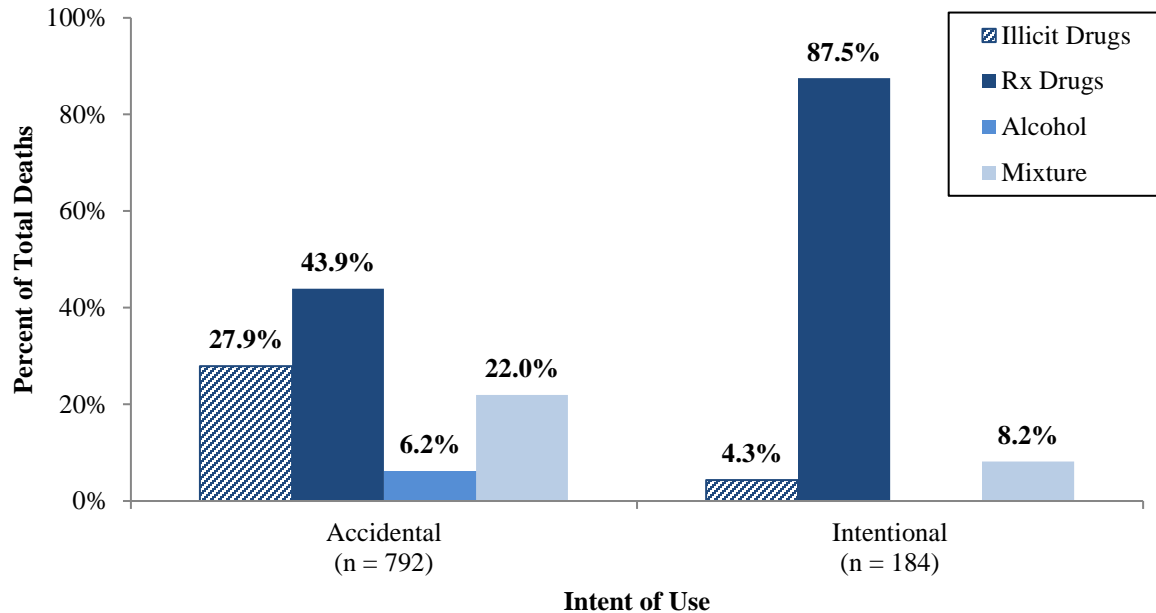
Over the course of this 3-year period, the number of accidental and intentional overdose deaths increased 6% (**Table 11**). Majority of deaths were due to accidental overdoses (78.6%). Approximately 18.6% of all overdose deaths were ruled intentional, while 2.8% of all cases the intent was undetermined.

**Table 11.** Number of Overdose Deaths by Intent of Drug Use (2013-2015)

	Number 2013	Number 2014	Number 2015	Total 2013-2015	Total % 2013-2015
Accidental	252	263	280	795	78.6%
Intentional	65	67	56	188	18.6%
Undetermined	6	10	12	28	2.8%
<b>Total</b>	<b>323</b>	<b>340</b>	<b>348</b>	<b>1011</b>	<b>100.0%</b>

Regardless of intent, the majority of decedents used prescription medication prior to an overdose death (**Figure 6**). More specifically, among those who intentionally overdosed, a large percentage used prescription drugs to end their life (87.5%). Roughly half (43.9%) of those who accidentally overdosed also used prescription medication while a little over a quarter (27.9%) used illicit drugs and about one in five (22.0%) individuals used a mixture of substances.

**Figure 6.** Percent of Overdose Deaths by Type of Drug and Intent (2013-2015)



Information regarding the specific types of substance(s) used prior to overdose were also investigated by the Coroner. This information was coded according to drug class (e.g., opioid, benzodiazepine, antidepressants) to better understand the categories of substances that caused an overdose death. Across all three years, 66.8% of all drug- and alcohol-related deaths investigated by the Coroner involved opioid substances, primarily in combination with other drugs and/or alcohol (**Table 12**). The majority of opioid involved deaths were classified as polydrug (85.8%,  $n = 579$  of 675), while 14.2% ( $n=96$ ) were opioid only deaths. Of all poly-drug use cases involving opioid substances, benzodiazepines were the most common drugs used in combination with opioids (50.6%). Other commonly used substance either alone or in combination with other drugs included benzodiazepine (36.0%), antidepressants (27.2%), alcohol (25.9%), and amphetamines (23.9%).

**Table 12.** Number of Annual Deaths by Major Drug Categories and Combinations (2013-2015)

	Number 2013	Number 2014	Number 2015	Total 2013-2015	Total % 2013-2015	3-Year Avg (per 100,000)
Opioid	222	225	228	675	66.8%	225.0
Benzodiazepine	129	117	118	364	36.0%	121.3
Antidepressants	96	90	89	275	27.2%	91.7
Alcohol	84	91	87	262	25.9%	87.3
Amphetamines	71	85	86	242	23.9%	80.7
Antihistamines	61	50	52	163	16.1%	54.3
Cocaine	10	9	4	23	2.3%	7.7
Barbiturates	5	8	8	21	2.1%	7.0

## PRESCRIPTION VS. ILLICIT OPIOID DRUGS

Given that the majority of overdose deaths investigated by the Coroner involved opioids, it was important to identify how many of these deaths were due to prescription versus illicit opioid drugs. Over the course of the 3-year period, 56.0% of all opioid-related overdose deaths were categorized as prescription opioid medication overdoses (**Table 13**). Opioid-related overdose deaths caused by illicit substances accounted for 17.3%.

**Table 13.** Opioid-Related Overdose Deaths Investigated by the Coroner (2013-2015)

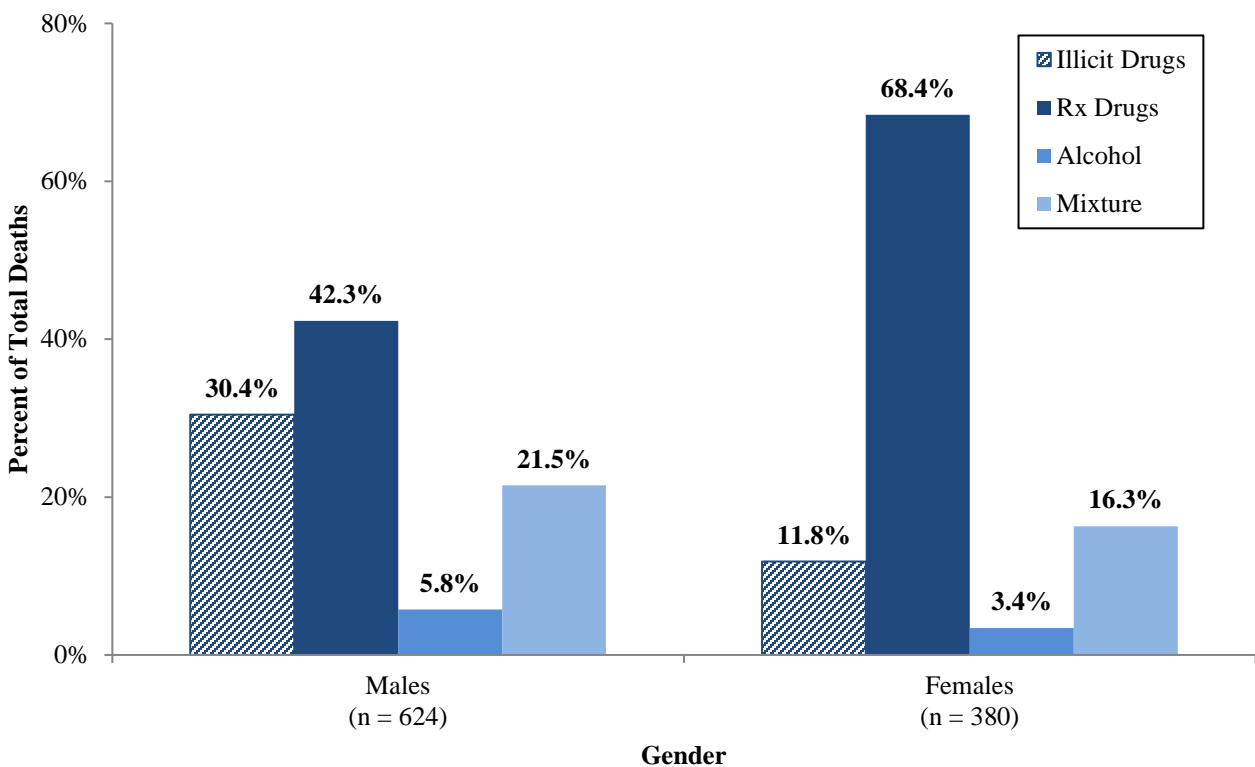
	Number 2013	Number 2014	Number 2015	Total 2013-2015	Total % 2013-2015
Prescription Opioids	129	122	127	378	56.0%
Mixture	52	65	63	180	26.7%
Illicit Opiates (e.g., heroin)	41	38	38	117	17.3%
Total	222	225	228	675	100.0%

## DEMOGRAPHIC PROFILES

### Gender

Between 2013 and 2015, females were 1.6 times more likely to overdose from prescription medication compared to males, and males were more than twice as likely to overdose from an illicit drug compared to females (**Figure 7**). For males, 42.3% of all overdoses were due to prescription drugs, 30.4% were illicit drugs, and 21.5% were a mixture of drugs and/or alcohol. Additionally, women had a smaller proportion of overdosing from illicit (11.8%), mixture (16.3%), and alcohol (3.4%) compared to males.

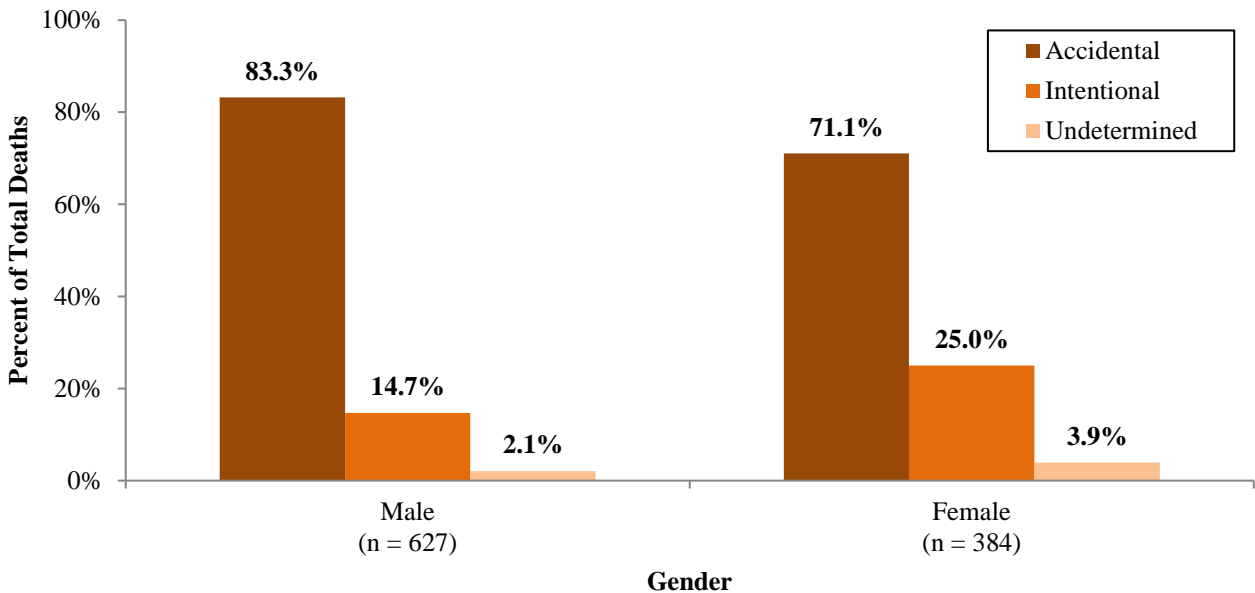
**Figure 7.** Gender Profile of Coroner-Investigated Deaths: Type of Substance (2013-2015)





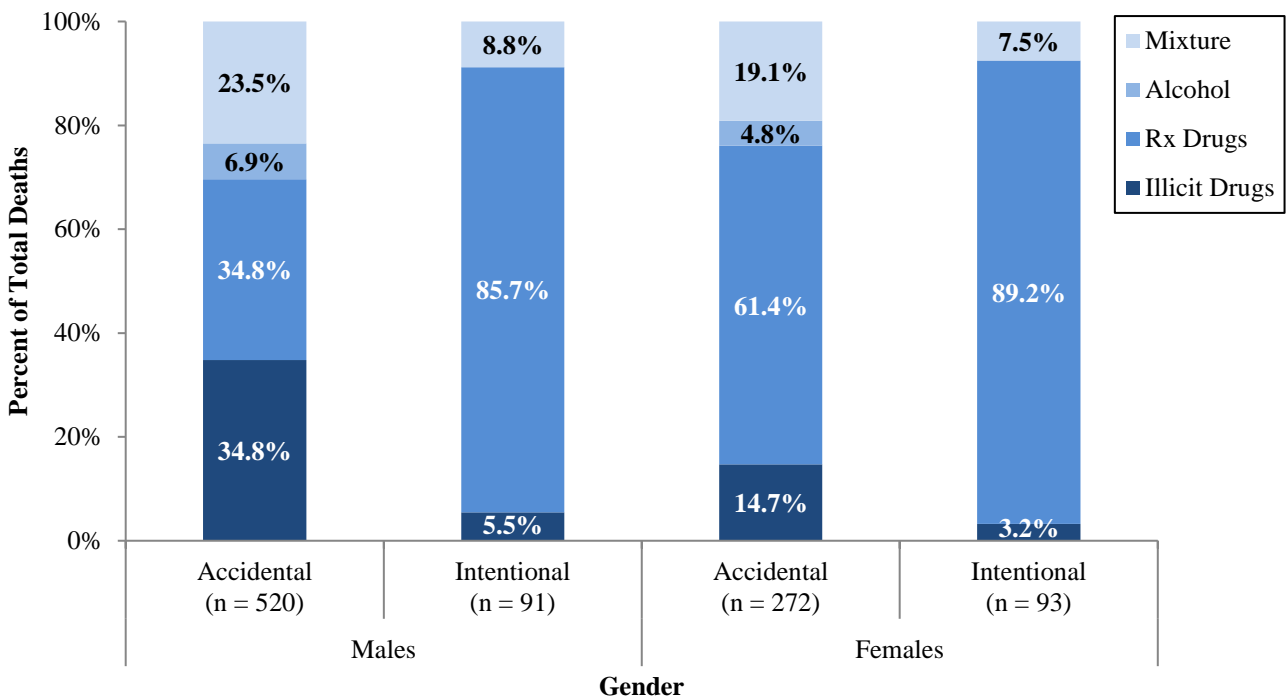
As shown in **Figure 8**, for both males and females, accidental overdose deaths were the most common. However, females were 1.7 times as likely to die from an intentional overdose when compared to males.

**Figure 8. Gender Profile of Coroner-Investigated Deaths: Intent (2013-2015)**



When examining the gender profile of decedents and the specific substance(s) used by intent, a majority of intentional overdose deaths for both males (85.7%) and females (89.2%) were due to prescription drugs, while very few were from illicit drugs (**Figure 9**). In cases of accidental overdose, males (34.8%) were twice as likely as females (14.7%) to have used illicit drugs, whereas females were more likely to accidentally overdose using prescription drugs when compared to males (61.4% vs 34.8%).

**Figure 9. Gender Profile of Coroner-Investigated Deaths: Intent by Substance (2013-2015)**

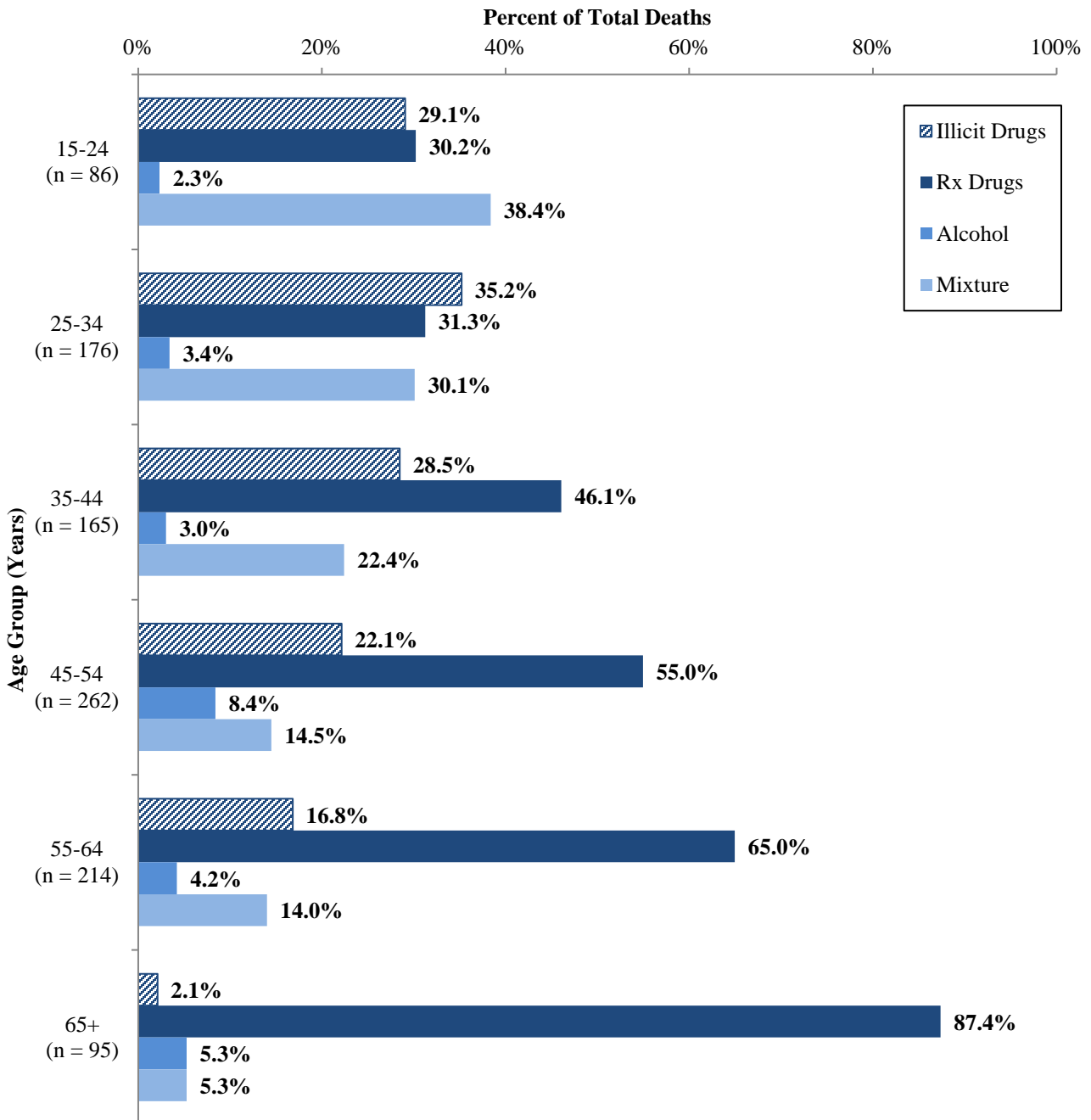


### Age

**Figure 10** presents results regarding the cumulative percentages for the type of substance(s) that led to an overdose death for each age group. The percent of overdose deaths due to prescription drugs increased as residents aged, while the percent of overdose deaths involving illicit drugs and mixtures decreased with age group.

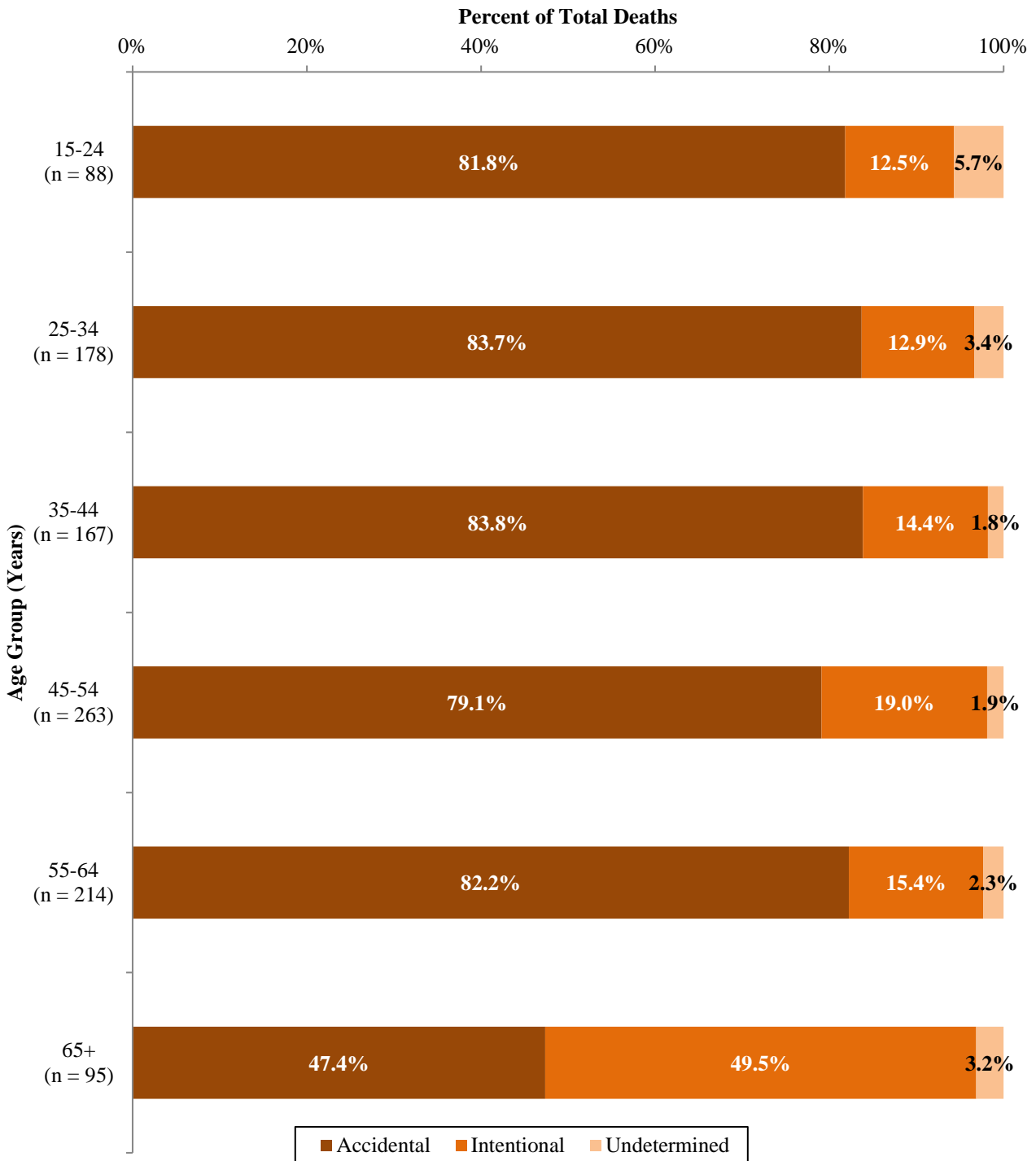
Between 2013 and 2015, the majority of overdose deaths were due to prescription drugs, but this percentage increased significantly among those 35 years of age and older and accounting for nearly all of overdose deaths in the 65 years of age and older age group (87.4%). Decedents aged 34 and under had fairly similar overdose death percentages contributed by illicit drugs, prescription drugs, and/or a mixture of substances.

**Figure 10.** Age Profile of Coroner-Investigated Deaths: Type of Substance (2013-2015)



Age profiles were also analyzed to examine the intent of drug use (**Figure 11**). The vast majority of people under the age of 65 years accidentally overdosed. However, among residents 65 years and older, a larger portion (49.5%) of overdose deaths were ruled intentional.

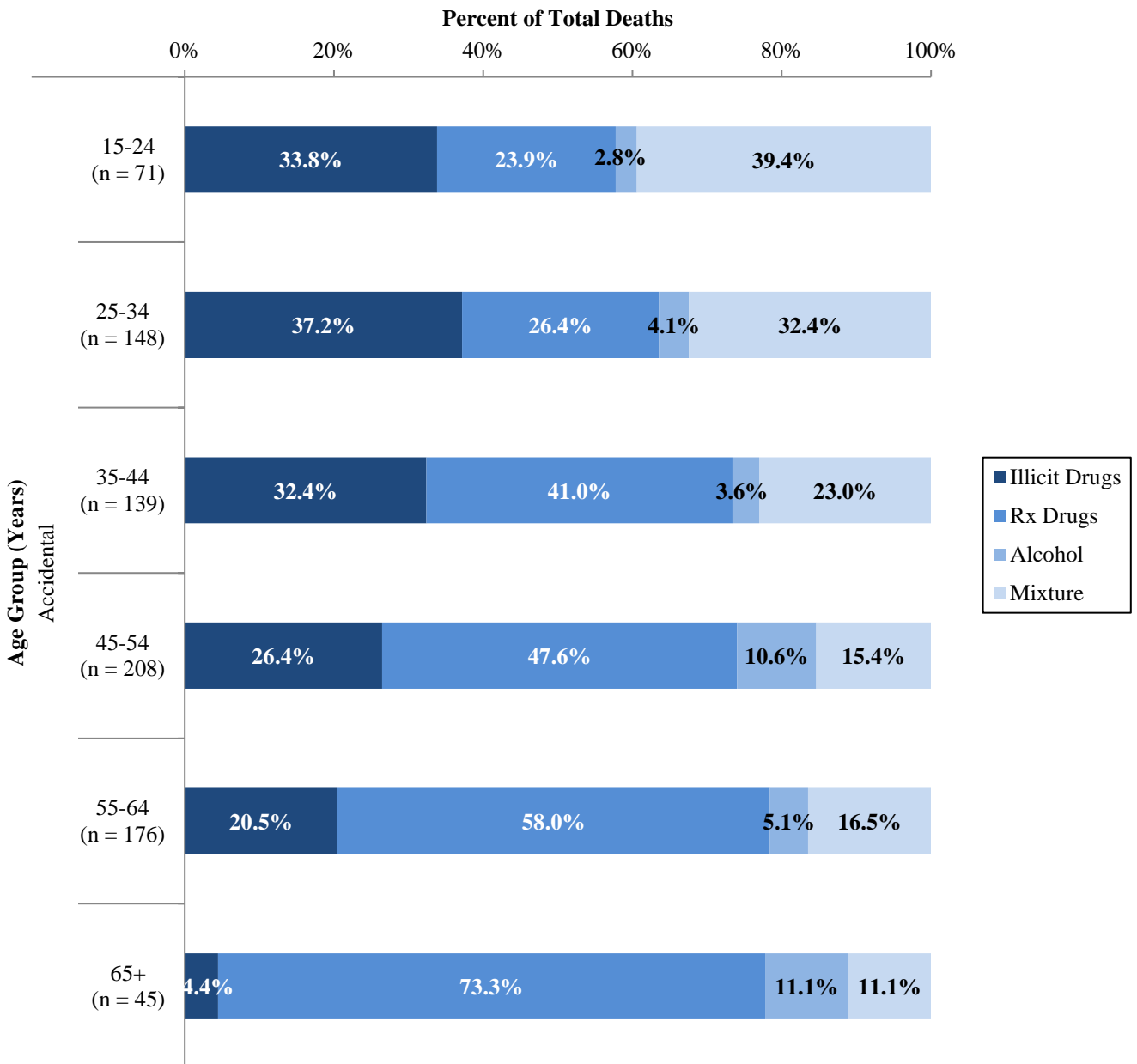
**Figure 11.** Age Profile of Coroner-Investigated Deaths: Intent (2013-2015)



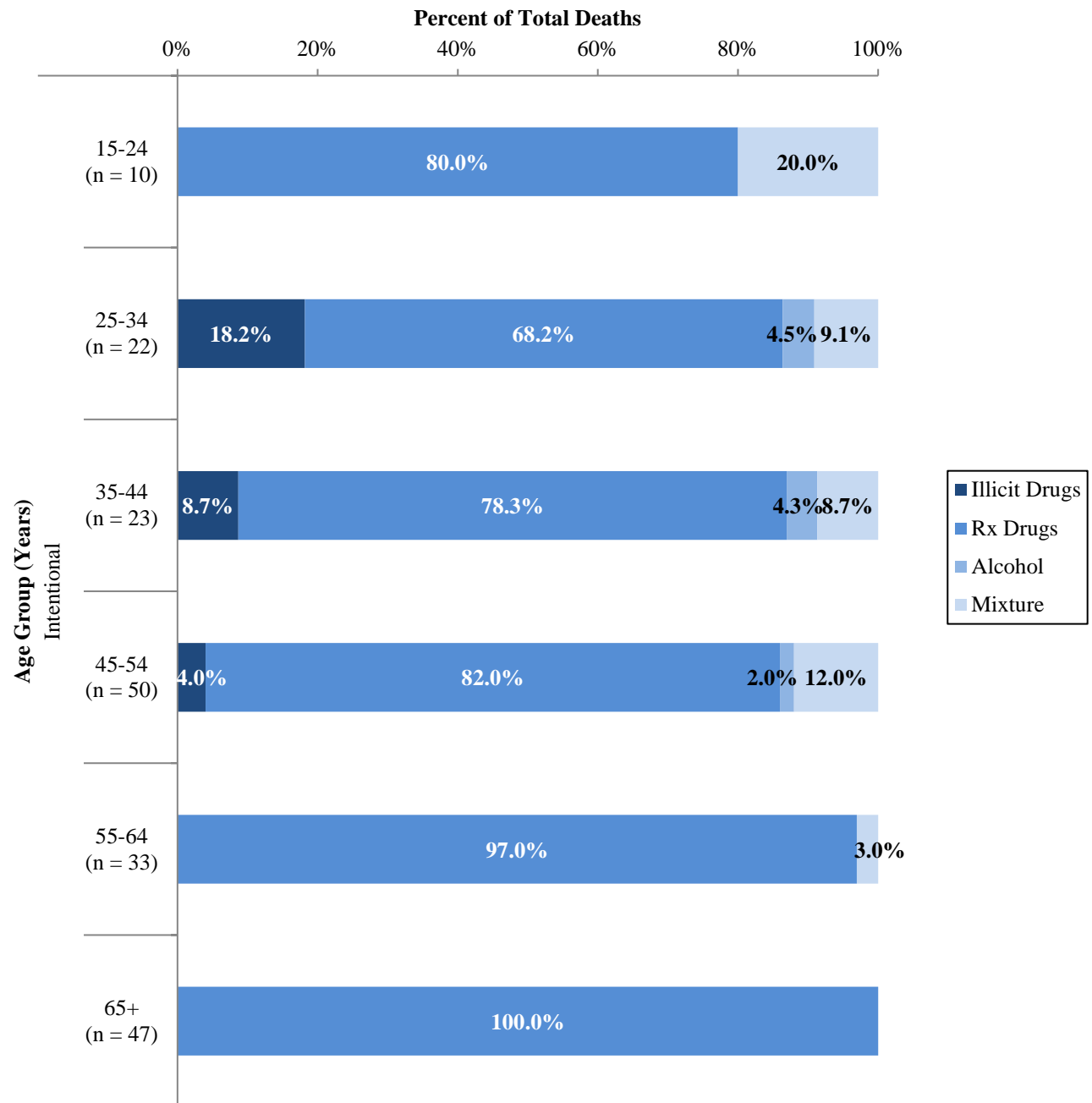
Analyses were then performed to determine the type of substance(s) decedents were using by their intent. As reported earlier, prescription drugs were the most frequently used substance across all age groups and strongly prevalent with intentional overdoses among all ages (**Figure 13**), and accidental overdoses in the age group of 35 years and older (**Figures 12**). More than two-thirds of all intentional overdoses in each age group were attributed to prescription drug abuse. Among Orange County residents, accidental overdoses due to prescription drugs increased with age while accidental overdoses due to illicit drugs decreased.

Use of illicit drugs was more prevalent than prescription drug use prior to accidental overdose among those aged 15 to 34. In the age group of 15 to 24, a mixture of drugs and/or alcohol attributed the most to accidental overdose (39.4%).

**Figure 12.** Age Profile of Coroner-Investigate Deaths: Accidental Overdose by Substance (2013-2015)



**Figure 13. Age Profile of Coroner-Investigate Deaths: Intentional Overdose by Substance (2013-2015)**

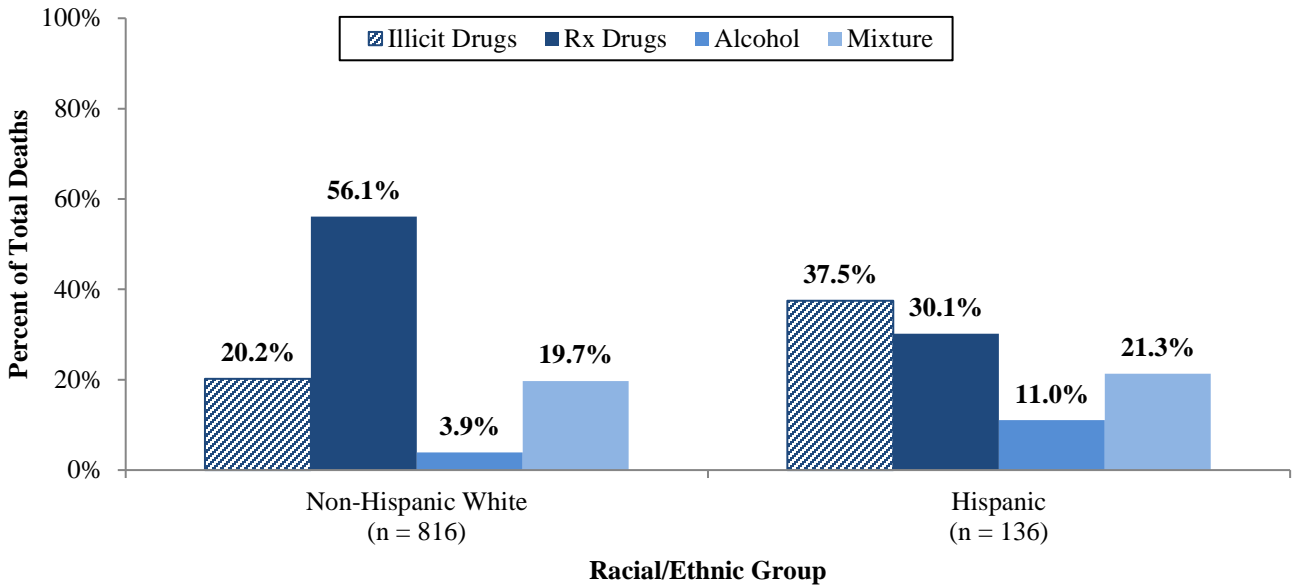


### Race & Ethnicity

This section of the report describes profiles for Non-Hispanic White and Hispanic residents. No interpretations were provided for Asian/Pacific Islander, African American, or other ethnic groups due to small sample sizes.

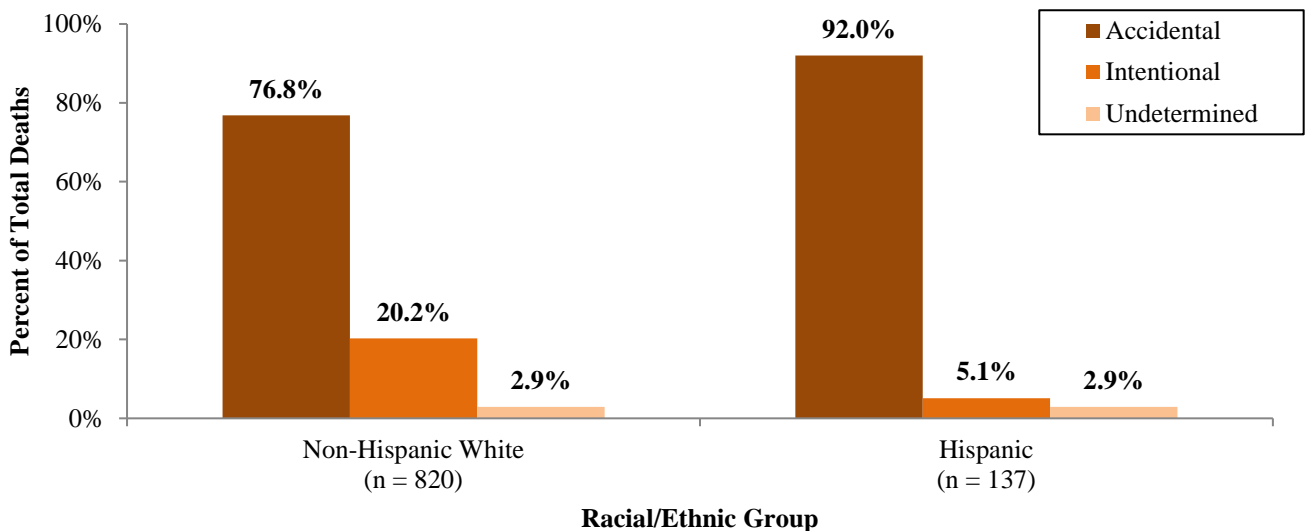
Hispanic residents were nearly twice as likely to die from an illicit drug overdose when compared to Non-Hispanic White residents (**Figure 14**). Specifically, 37.5% of all overdose deaths among Hispanics were from illicit drugs while it was 20.2% among Non-Hispanic Whites. Over half of Non-Hispanic Whites (56.1%) and 30.1% of Hispanics overdosed from prescription drugs. Moreover, Non-Hispanic Whites were 1.86 times more likely to overdose using prescription drugs than Hispanics.

**Figure 14.** Racial/Ethnic Profile of Coroner-Investigated Deaths: Type of Substance (2013-2015)



Drug- and alcohol-related overdose deaths frequently occurred by accident among Non-Hispanic White and Hispanic residents (**Figure 15**). While 76.8% of overdose deaths among Non-Hispanic Whites were accidental, nearly all, or 92.0%, of overdose deaths among Hispanics were accidental. Non-Hispanic Whites were four times more likely to intentionally overdose compared to Hispanic residents.

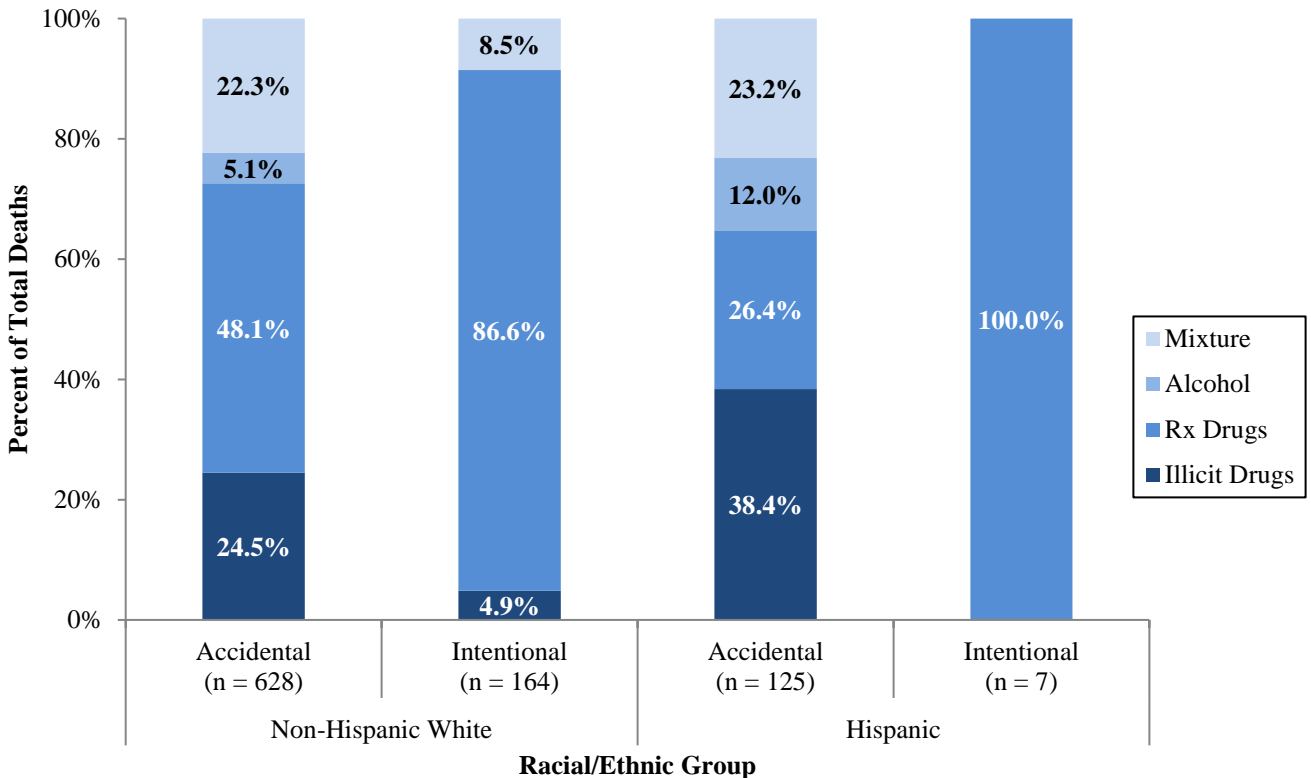
**Figure 15.** Racial/Ethnic Profile of Coroner-Investigated Deaths: Intent (2013-2015)





When examining the intent of use by type of substance used (**Figure 16**), intentional overdose was largely attributed to prescription drugs for both groups (Non-Hispanic White, 86.6%; Hispanic, 100%). Non-Hispanic Whites were 1.8 times more likely to accidentally overdose after using prescription drugs (48.1%) compared to Hispanics (26.4%). Roughly one quarter (24.5%) of accidental deaths among Non-Hispanic Whites was due to illicit drugs, while nearly four in ten Hispanics (38.4%) accidentally overdosed from the same type of drugs.

**Figure 16. Racial/Ethnic Profile of Coroner-Investigated Deaths: Intent by Substance (2013-2015)**



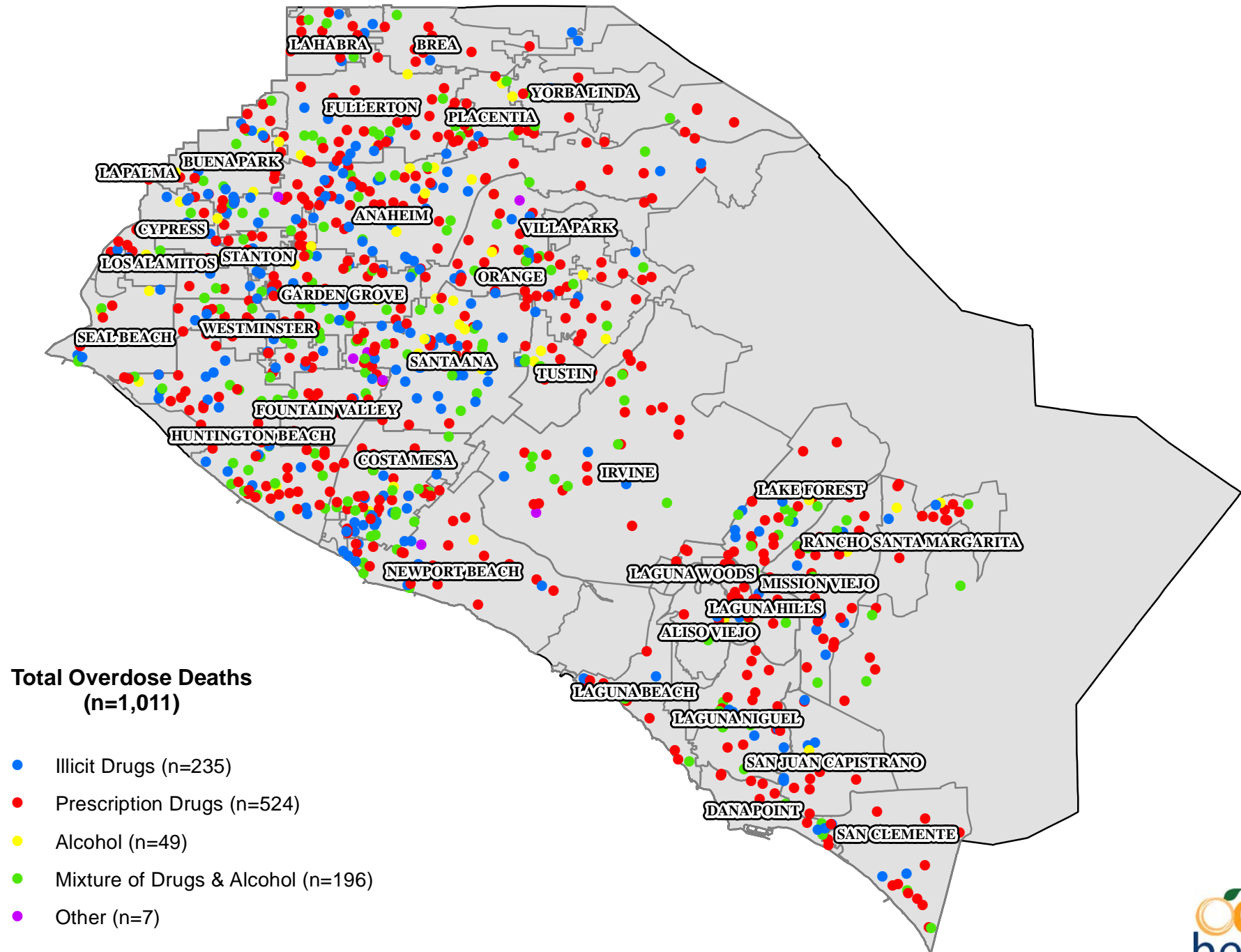
### Geography

Several cities in northern and central Orange County regions reflected a higher frequency of Coroner-investigated drug- and alcohol- overdose deaths (see **Table 14** and **Map 3**). Blue dots in **Map 3** correspond to instances of illicit drug overdoses, red dots to prescription drug overdose deaths, yellow dots to alcohol overdose, green dots to a mixture of drugs and alcohol overdose, and purple dots for other overdoses. Of those whose addresses were provided by the Coroner's office, individuals living in Anaheim ( $n = 116$ ), Huntington Beach ( $n = 87$ ), Santa Ana ( $n = 87$ ), and Costa Mesa ( $n = 62$ ) were more likely to have occurrences of drug or alcohol overdose deaths.

**Table 14.** Drug and Alcohol Overdose Deaths Coroner-Investigated Deaths by City (2013-2015)

	Illicit Drugs Number	Prescription Drugs Number	Alcohol Number	Mixture of Alcohol & Drugs Number	Other Number	Total Number
Anaheim	35	57	7	16	1	116
Huntington Beach	17	44	3	23	0	87
Santa Ana	29	31	8	16	3	87
Costa Mesa	16	26	2	18	0	62
Garden Grove	17	24	2	15	0	58
Orange	11	30	2	10	1	54
Fullerton	8	26	4	7	0	45
Mission Viejo	8	20	1	6	0	35
Newport Beach	9	19	1	5	1	34
Buena Park	8	14	3	6	0	31
Irvine	3	19	0	8	1	31
Westminster	8	14	0	9	0	31
Laguna Niguel	5	18	0	7	0	30
Lake Forest	6	14	1	9	0	30
Fountain Valley	5	13	0	3	0	21
San Clemente	3	13	0	2	0	18
Cypress	6	8	2	1	0	17
Rancho Santa Margarita	2	12	2	1	0	17
Dana Point	2	10	0	4	0	16
La Habra	4	9	0	3	0	16
Placentia	2	8	1	5	0	16
San Juan Capistrano	6	9	1	0	0	16
Yorba Linda	1	10	1	3	0	15
Laguna Beach	2	10	0	2	0	14
Laguna Hills	3	9	0	2	0	14
Tustin	2	7	2	3	0	14
Brea	3	9	0	1	0	13
Seal Beach	3	4	2	3	0	12
Aliso Viejo	2	6	1	2	0	11
Laguna Woods	0	11	0	0	0	11
Los Alamitos	3	6	1	1	0	11
Stanton	3	5	1	1	0	10
Midway City	2	2	0	1	0	5
La Palma	1	2	1	0	0	4
Ladera Ranch	0	3	0	1	0	4
Foothill Ranch	0	2	0	0	0	2
Trabuco Canyon	0	0	0	2	0	2
<b>Total</b>	<b>235</b>	<b>524</b>	<b>49</b>	<b>196</b>	<b>7</b>	<b>1,011</b>

# Map 3. Coroner-Investigated Drug and Alcohol Overdose Deaths by City (2013-2015)



## SUMMARY

Between 2013 and 2015, there were 16,396 hospitalizations and 2,047 deaths related to drug and alcohol overdoses or poisonings. This averages to approximately 5,500 hospitalizations and nearly 700 deaths each year. In addition, the Sheriffs-Coroner Office investigated 1,011 overdose deaths, for an average of 337 overdose deaths each year. To summarize the results of this report, the findings will be presented by outcome.

### **Substance-related Hospitalizations**

- Males had a higher rate of hospitalizations when compared to females (20.2 vs 14.8 per 100,000), and comprised 58.1% of all hospitalizations.
- Individuals in the age group of 45 to 54 years old had the highest number and rate of hospitalizations at 29.4 per 100,000.
- Majority of hospitalizations were Non-Hispanic White (78%) with a rate of 32.2 per 100,000, followed by Hispanic (14%; 7.2 per 100,000), Asian/Pacific Islander (3%; 3.0 per 100,000), and African American (2%; 18.0 per 100,000). African American demonstrated a high rate but had a very small number of cases.
- Higher rates of hospitalizations were found in coastal and southern cities in Orange County (e.g., Dana Point, Laguna Beach, and Laguna Woods).
- There were nearly 70,000 hospital bed-days with an average stay length of 4.3 days, which resulted in approximately \$430 million in total charges.

### **Substance-related Deaths**

- The rate of drug and alcohol overdose deaths increased 82% from 2000 to 2015 (12.5 vs 22.7 per 100,000, respectively). In the same time period, drug overdose rates increased 88% (6.5 vs 12.3 per 100,000) and alcohol-related deaths increased 76% (6.0 vs 10.5 per 100,000).
- Accidental overdoses were the most common cause of death regardless of the substance used comprising 75% of all poisoning overdoses deaths, followed by 22% of cases being intentional.
- All coroner-investigated overdose deaths indicated a majority were accidental (78.6%), with over half involving prescription drugs (51.8%), and 66.8% related to opioid use. Over half of all opioid-related overdoses were due to prescription opioids (56.0%).
- Males were twice as likely to die from an overdose compared to females (29.5 vs 14.4 per 100,000).
- Coroner-investigated overdoses demonstrated females were 1.6 times more likely than males to overdose from prescription drugs and the proportion of prescription drug overdoses increased with age group starting with the 35 to 44 year age group (46.1%) to 65 years and older (87.4%).
- Decedents between the ages of 55 to 64 years exhibited the highest overdose death rate (51.6 per 100,000), followed by individuals aged 45 to 54 years (41.5 per 100,000).
- Non-Hispanic White residents had the highest rate of overdose deaths and comprised 70.2% of all overdose deaths.
- Similar to geographic findings from alcohol and drug hospitalizations, coastal and southern had higher rates of overdose deaths. Laguna Woods had the highest overdose death rate (50.8 per 100,000) followed by Dana Point (40.1 per 100,000) and Seal Beach (33.8 per 100,000).

### **Compared to drug & alcohol overdose hospitalization & death in Orange County (2014)**

- Overall, the average rate of hospitalization stayed the same between the 2014 and 2017 reports (17.5 per 100,000). Hospitalization rates increased among Hispanic, Asian/Pacific Islander, and African American ethnic groups, but Non-Hispanic White remained the same.
- Drug and alcohol-related death rates have increased from 18.7 per 100,000 in 2014 to 21.9 per 100,000 in 2015. The death rate among the 55 to 64 age group increased significantly from 40.1 to

51.6 per 100,000. Non-Hispanic White death rates also increased slightly from 30.2 to 36.5 per 100,000.

- The number of coroner-investigated overdose deaths increased by 48 cases or 16 cases per year. A shift in drug type trends indicated prescription drug overdoses decreased by 2.4%, but illicit drug overdoses increased by 2.1%; however, prescription drugs remained as the leading drug type involved in an overdose.
- Laguna Woods had one of the highest hospitalization and overdose death rates replacing Los Alamitos from the previous report. Dana Point remained as one of the cities in Orange County with the highest hospitalization and death rates along with high hospitalization rates in Laguna Beach and high overdose death rates in Laguna Woods.

The Health Care Agency offers several different public education, treatment, and counseling services aimed at reducing the misuse and abuse of drugs and alcohol. To support these educational initiatives, the Agency and our partners often host events to provide a safe and responsible way for residents to dispose of unused prescription medication (<http://ochealthinfo.com/eh/waste/medwaste/medwaste>). Our efforts focus on providing consumers and professionals in the behavioral health field with accurate information regarding the potential risk factors associated with drug and alcohol abuse. For more information on Health Care Agency Behavioral Health Services, please call the information and referral line at 855-OC-Links (625-4657).

## REFERENCES

- Alcohol and Other Drug Use Prevalence: 2012 Survey of Orange County Adults. A Report of Orange County Health Care Agency. Available from URL: [www.ochealthinfo.com/adept](http://www.ochealthinfo.com/adept)
- Rudd, R. A., Aleshire, N., Zibbel, J. E., & Gladden, R. M. (2016). Increases in drug and opioid overdose deaths — United States, 2000–2014. *MMWR*, 64(50), 1378-1382.
- Center for Disease Control and Prevention. (CDC, 2013a). Opioids drive continued increase in drug overdose deaths. Available from URL: [http://www.cdc.gov/media/releases/2013/p0220\\_drug\\_overdose\\_deaths.html](http://www.cdc.gov/media/releases/2013/p0220_drug_overdose_deaths.html).
- Center for Disease Control and Prevention. (CDC, 2013b). Deaths: Final Data for 2010. Available from URL: [http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61\\_04\\_tables.pdf#I05](http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04_tables.pdf#I05).
- Center for Disease Control and Prevention. (CDC, 2014). Prescription drug overdose in the United States: Fact sheet [online]. Available from URL: <http://www.cdc.gov/homeandrecreationalsafety/overdose/facts.html>.
- Chen, L. H., Hedegaard, H., & Warner, M. (2014). Drug-poisoning deaths involving opioid analgesics: United States, 1999-2011. National Center for Health Statistics. Data Brief, No. 166. Available from URL: <http://www.cdc.gov/nchs/data/databriefs/db166.pdf>
- Health Policy, Research, and Communication. (2014). Drug & alcohol overdose hospitalization & death in Orange County. County of Orange Health Care Agency. Available from URL: <http://ochealthinfo.com/about/admin/pubs>
- Center for Behavioral Health Statistics and Quality. (2016). Results from the 2015 National Survey on Drug Use and Health: Detailed tables. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Stahre, M., Roeber, J., Kanny, D., Brewer, R. D., & Zhang, X. (2014). Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Preventing Chronic Disease*, 11(E109).
- Sacks, J. J., Gonzales, K. R., Bouchery, E. E., Tomedi, L. E., & Brewer, R. D. (2015). 2010 national and state costs of excessive alcohol consumption. *American Journal of Preventive Medicine*, 49(5), e73-e79.
- National Drug Intelligence Center. (2011). National drug threat assessment. Washington, DC: U.S. Department of Justice.
- Levy, B., Paulozzi, L., Mack, K. A., & Jones, C. M. (2015). Trends in opioid analgesic-prescribing rates by specialty, US, 2007–2012. *American Journal of Preventive Medicine*, 49(3), 409-413.
- Volkow, N. D., McLellan, T. A., Cotto, J. H., Karithanom, M., & Weiss, S. R. B. (2011). Characteristics of opioid prescriptions in 2009. *The Journal of the American Medical Association*, 305(13), 1299-1301.
- Office of the Surgeon General. (2016). Facing Addiction in America: The Surgeon General’s Report on Alcohol, Drugs, and Health. Washington, DC: U.S. Department of Health and Human Services (HHS)
- Jones, C. M., Mack, K. A., Paulozzi, L. J. (2010). Pharmaceutical overdose deaths, United States, 2010. *The Journal of the American Medical Association*, 309, 657-659.
- Mack, K. A., Jones, C. M., & Paulozzi, L. J. (2013). Vital signs: Overdoses of prescription opioid pain relievers and other drugs among women: United States, 1999-2010. *Morbidity and Mortality Weekly Report*, 62(26), 537-542.
- Okie, S. (2010). A flood of opioids, a rising tide of death. *The New England Journal of Medicine*, 363(21), 1981-1985.
- Paulozzi, L. J., Jones, C. M., Mack, K. A., Rudd, R. A. (2011). Vital signs: Overdoses of prescription opioid pain relievers-United States, 1999-2008. *Morbidity and Mortality Weekly Report*, 60(43), 1487-1492.