

ORANGE COUNTY
HEALTH CARE AGENCY & SHERIFF-CORONER



**DRUG & ALCOHOL OVERDOSE
HOSPITALIZATION & DEATH IN
ORANGE COUNTY**

2014



Drug & Alcohol Overdose Hospitalization & Death in Orange County

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Acknowledgements

We would like to acknowledge our colleagues for their insightful comments and feedback on this report:

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Suggested Citation

“Drug & Alcohol Overdose Hospitalization & Death in Orange County. Orange County Health Care Agency and Orange County Sheriff-Coroner Department. Santa Ana, California, October 2014.”

This report is available online at www.ochealthinfo.com/pubs.

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INTRODUCTION

Over the past decade the rate of drug-induced overdose deaths in the United States has increased significantly (CDC, 2013a; Chen et al., 2014), with about 100 people dying every day from drug-related overdoses (CDC, 2013b). Similarly, hospitalization rates due to drug and/or alcohol consumption have increased in the last 10 years, and over \$1 billion is spent annually on substance-related hospitalizations (White et al, 2011). In 2008, the rate of drug-related overdose deaths in the United States was 11.9 per 100,000, which was three times the rate in 1991 (Paulozzi et al, 2011). Although lower than the national rate, drug-related mortality rates have increased in California from 10.4 per 100,000 in 2008 (Paulozzi et al, 2011) to 10.6 in 2010 (“Prescription Drug,” 2014). Nation-wide, alcohol-induced mortality also increased about 19% between 1999 and 2010 (7.0 vs. 8.3 per 100,000; Murphy et al., 2013).

The top drugs involved in premature mortality in the United States include opiates, cocaine, alcohol, stimulants, and antidepressants (DAWN, 2008). Additionally, roughly 60% of drug-related overdose deaths involve prescription drugs (CDC, 2013a; Serna, 2013). Poly-drug use, which is the concurrent use of more than one drug and/or alcohol substance, has also been identified as a contributing risk factor that increases the likelihood of a substance-related overdose death. The CDC (2014) also found the lethal combination of benzodiazepines and opioids was a leading cause of overdose in the nation (CDC, 2014; Chen et al., 2014). It has been speculated that drug overdose deaths related to poly-drug use may be related to the surge in hospitalizations and overdose deaths (CDC, 2013a; Paulozzi et al, 2011).

In order to better tailor local education and prevention efforts, it is important to understand not only the types of drugs involved, but also the intent of use in the cases of overdose deaths in Orange County. A large percentage of drug-related overdose deaths in the United States are categorized as accidental (74%), while 17% are intentional in nature (Okie, 2010).

A recent report in Orange County revealed that while cancer and heart disease were the two leading causes of premature death in the county, unintentional injury deaths, primarily drug overdose, was the third leading cause (Premature Death, 2014). The report also revealed that unintentional injuries were the number one cause of premature

death for both youth ages 15-24 years old and adults ages 25-44 years old in the county, ahead of all other causes of early death. That report, however, did not examine overdose rates separately from other forms of unintentional injuries, and did not report overdose rates by intent. Orange County also reported that nearly a quarter (22.5%) of all suicide deaths in the County between 2009 and 2011 were attributed to illicit, prescription, and/or alcohol substances (Suicide Deaths, 2014).



In a 2012 household survey of drug and alcohol use in Orange County, the Health Care Agency found that 62% (or 1,406,000) of adults reported using alcohol, 8% (or 188,000) used illicit drugs, and 2% (or 53,000) reported misusing prescription drugs during the past year (Alcohol and Other Drug Use Prevalence, 2014). With this in mind, the present report examined characteristics of drug and alcohol abuse for Orange County residents that resulted in a hospitalization and/or death. Hospitalization cases were collected from the Office of Statewide Health Planning and Development – Patient Discharge Data (OSHDPD-PD) and were categorized according to the *International Classification of Disease 9th Revision* (ICD-9). Moreover, information on drug and alcohol overdose deaths was analyzed from two separate sources, the Master Death File and the Orange County Sheriff's Department, Coroner Division.

The Master Death File described deaths according to the *International Classification of Disease 10th Revision* (ICD-10) manual and highlighted the intent of drug or alcohol use according to these codes. The Coroner provided more detailed information regarding the type of substance(s) used prior to overdose (i.e., prescription, illicit, alcohol, mixture, other) and the drug use intent (i.e., accident, suicide, undetermined). The first section of the report describes occurrences of drug- and/or alcohol-related hospital admissions between 2011 and 2012. The second section of this report examines overdose deaths using both the Master Death File (2011-2012) and Coroner data (2011-2013) for Orange County residents to better understand the factors associated with drug and alcohol abuse morbidity and mortality.

Overall, the current report highlights factors that contributed to hospitalizations and overdose deaths among Orange County residents, such as drug use intent and types of substances used. It also presents findings for gender, age, race/ethnicity, and geographic differences in order to identify profiles of those who overdosed from alcohol and/or drugs in Orange County. These findings and profiles are intended to help guide local substance abuse education, treatment, and suicide prevention efforts.



DRUG- & ALCOHOL-RELATED HOSPITALIZATIONS

For all Orange County residents, drug- and alcohol-related hospitalizations for 2011 and 2012 are summarized in **Table 1** based on principal diagnosis from the ICD-9 manual at discharge. Nearly four in ten of the 10,782 hospitalizations (37.2%) 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 third of these hospitalizations were also for non-psychotic disorders ($n = 4,016$, 32.8%), characterized primarily as chronic alcohol dependence syndrome or drug dependence. Among these types of disorders, alcohol was the leading contributor to hospitalizations ($n = 1,863$, 17.3%). Opioid dependence was the second leading cause of substance-related hospitalizations in Orange County ($n = 963$, 8.9%).

Table 1. Drug- and Alcohol-Related Hospitalizations for Orange County Residents (2011-2012)

Principle Diagnosis (ICD-9 Codes)	Number 2011	Number 2012	Total 2011-2012	Total % 2011-2012
Mental Disorders: Organic Psychotic Conditions (290-294)	1,723	2,293	4,016	37.2%
Alcohol-Induced Mental Disorders (291: e.g., delirium tremens, withdrawal)	1,134	1,517	2,651	24.6%
Drug-Induced Mental Disorders (292: withdrawal)	589	776	1,365	12.7%
Neurotic, Personality, & other Non-Psychotic Mental Disorders (300-316)	1,905	1,629	3,534	32.8%
Alcohol Dependence Syndrome (303: alcohol intoxication)	1,068	795	1,863	17.3%
<i>Drug Dependence (304.0 – 304.9)</i>	638	647	1,285	11.9%
Opioid Dependence (304.0)	473	490	963	8.9%
Sedative, Hypnotic, Anxiolytic Dependence (304.1; Barbiturate & Non-Barb)	47	51	98	0.9%
Cocaine Dependence (304.2)	10	8	18	0.2%
Cannabis Dependence (304.3)	13	16	29	0.3%
Amphetamine & Other Psychostimulant Dependence (304.4)	34	34	68	0.6%
Other Drug Dependence (304.6: e.g., glue sniffing, inhalants)	1	3	4	0.0%
Combinations of Opioid Type Drug with any other drugs (304.7)	48	33	81	0.8%
Combinations of Drug Dependence (Excluding Opioids) (304.8)	8	11	19	0.2%
Unspecified Drug Dependence (304.9)	4	1	5	0.0%
<i>Non-Dependent Abuse (305.0 – 305.9)</i>	199	187	386	3.6%
Non-Dependent Abuse of Alcohol (305.0)	136	128	264	2.4%
Non-Dependent Abuse of Cannabis (305.2)	4	4	8	0.1%
Non-Dependent Abuse Hallucinogen (305.3)	1	0	1	0.0%
Non-Dependent Barbiturate Abuse (305.4)	0	6	6	0.1%
Non-Dependent Abuse Opioid (305.5)	5	10	15	0.1%
Non-Dependent Abuse Cocaine (305.6)	5	2	7	0.1%
Non-Dependent Abuse Amphetamine (305.7)	16	20	36	0.3%
Non-Dependent Abuse of Other, Mixed or Unspecific Drugs (305.9)	32	17	49	0.5%

Poisonings by drugs, medicinals, and other biological substances accounted for 27.9% ($n = 3,003$) 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 ($n = 1,056$; 9.8%) or opioid substances ($n = 369$, 3.4%). 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: Principle Diagnosis (ICD-9 Codes)	Number 2011	Number 2012	Total 2011-2012	Total % 2011-2012
Poisoning by Drugs, Medicinals and Biological Substances (960-979)	1,423	1,580	3,003	27.9%
Poisoning by Medicinal Drugs (960-964) (e.g., antibiotics, insulin)	107	121	228	2.1%
Poisoning by Opium (965.00)	67	87	154	1.4%
Poisoning by Heroin (965.01)	39	83	122	1.1%
Poisoning by Methadone (965.02)	36	37	73	0.7%
Poisoning by Other Narcotics (965.09; Codeine, Morphine)	124	118	242	2.2%
Poisoning by Salicylates (965.1; e.g., aspirin)	25	28	53	0.5%
Poisoning by Aromatic Analgesics (965.4; e.g., acetaminophen)	189	180	369	3.4%
Poisoning by Propionic Acid Derivatives (965.61; e.g., ibuprofen)	23	24	47	0.4%
Poisoning by Other Antirheumatics (965.69; gold salts)	2	1	3	0.0%
Poisoning by Analgesics/Antipyretics (965.8; Pentazocine or synthetic opioid)	3	14	17	0.2%
Poisoning by Unspecified Analgesic/Antipyretic (965.9)	1	5	6	0.1%
Poisoning by Anticonvulsants & Anti-Parkinson Drugs (966)	45	31	76	0.7%
Poisoning by Sedative and Hypnotics (967)	82	98	180	1.7%
Poisoning by other CNS Depressants & Anesthetics (968)	54	38	92	0.9%
Poisoning by Psychotropic Agents (969; e.g., Benzodiazepine tranquilizers)	491	565	1,056	9.8%
Poisoning by CNS Stimulants (970; e.g., opiate antagonists naloxone)	17	19	36	0.3%
Poisoning by Other Medicinal Medicines (971 - 979)	118	131	249	2.3%
Toxic Effects of Substances Chiefly Non-Medicinal as to Source (980-989)	107	109	216	2.0%
Toxic Effect of Alcohol (980; ethyl alcohol, methyl alcohol)	42	56	98	0.9%
Toxic Effect of Carbon Monoxide (986)	11	4	15	0.1%
Toxic Effects of Venom (989.5; e.g., venomous snakes & spiders)	14	24	38	0.4%
Other Substances	40	25	65	0.6%
Other and Unspecified Effects of External Causes (990-995)	5	8	13	0.1%
Drug Allergy (995.27)	2	1	3	0.0%
Adverse Effects of Med/Biological Substance NEC/NOS (995.29)	3	7	10	0.1%
Total	5,163	5,619	10,782	100.0%

DEMOGRAPHIC DIFFERENCES

GENDER

A little over half (56%) of substance hospitalizations were among males ($n = 6,067$), while 44% ($n = 4,715$) of those who were hospitalized were female (**Table 2**). Males had an average hospitalization rate of 20 per 10,000, which was 31% higher than that of females at 15.2 per 10,000.

Table 2. Gender of Drug & Alcohol-Related Hospitalization Patients (2011 & 2012)

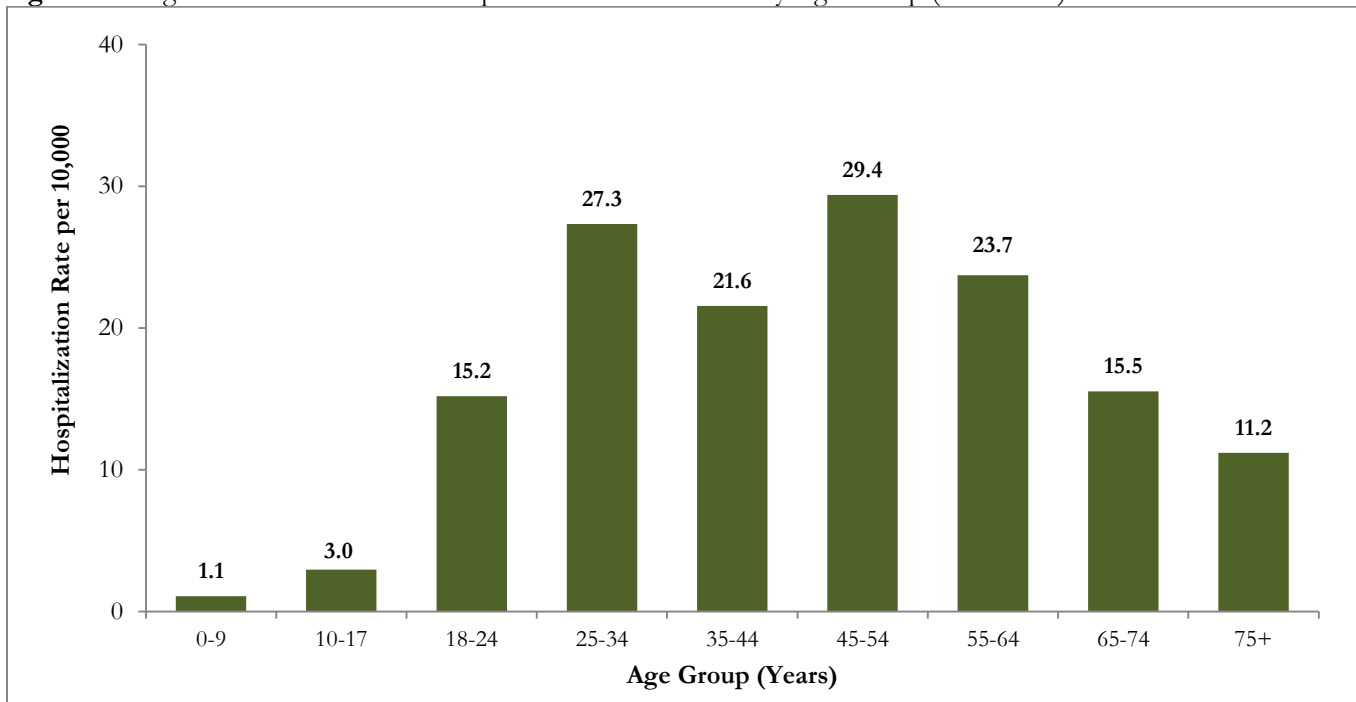
	2011 Number	2012 Number	Total Number	2-Yr Avg. Number	2-Yr Avg. Rate (per 10,000)
Male	2,817	3,250	6,067	3,033.5	20.0
Female	2,346	2,369	4,715	2,357.5	15.2
Total	5,163	5,619	10,782	5,391.0	17.5

AGE GROUPS

The highest rates of hospitalizations were for individuals between 45-54 years old at 29.4 (per 10,000), followed by 25-34 (27.3 per 10,000) and 55-64 (23.7 per 10,000) year olds (**Figure 1**). The very young (<25 years) and very old (>64 years) had lower rates than the rest of the age groups.

Adults 25 to 64 years of age accounted for 79% of all drug- and alcohol-related hospitalizations during 2011-12. Children less than 18 years of age accounted for less than 3% of all such hospitalizations, while seniors 65+ accounted for about 10%.

Figure 1. Drug- and Alcohol-Related Hospitalization Crude Rates by Age Group (2011-2012)

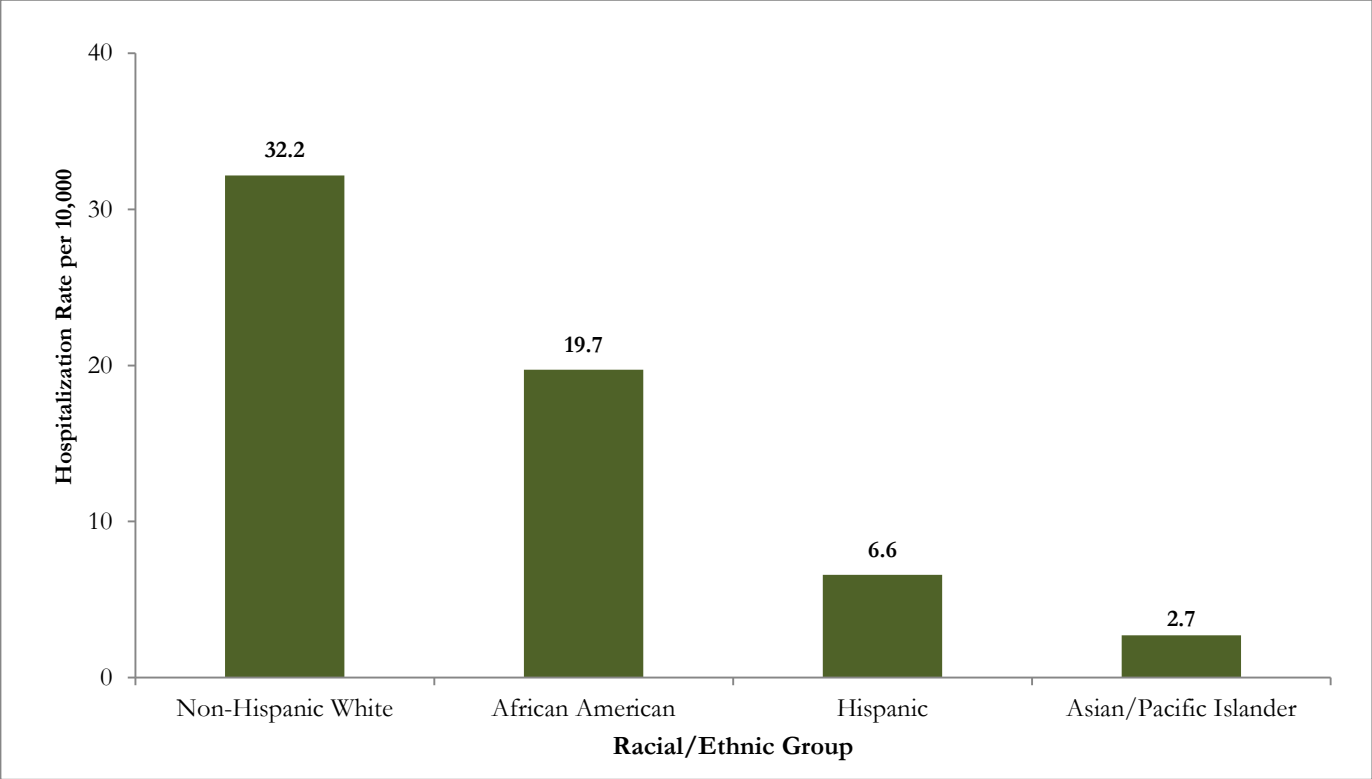


RACE & ETHNICITY

The overwhelming majority (79%) of drug- and alcohol-related hospitalizations were among non-Hispanic Whites (*n* = 8,515), followed by Hispanics at 12.9% (*n* = 1,388), Asian/Pacific Islanders at 2.9% (*n* = 318), and African Americans at 1.7% (*n* = 184).

As shown in **Figure 2**, non-Hispanic Whites also had the highest rate of hospitalization for drug- and alcohol-related issues at 32.2 (per 10,000 population). African Americans had the second highest rate at 19.7, albeit a very small population size, followed by Hispanics at 6.6 and Asian/Pacific Islanders at 2.7 (per 10,000 population).

Figure 2. Drug- and Alcohol-Related Hospitalization Crude Rates by Racial/Ethnic Group (2011-2012)



GEOGRAPHY

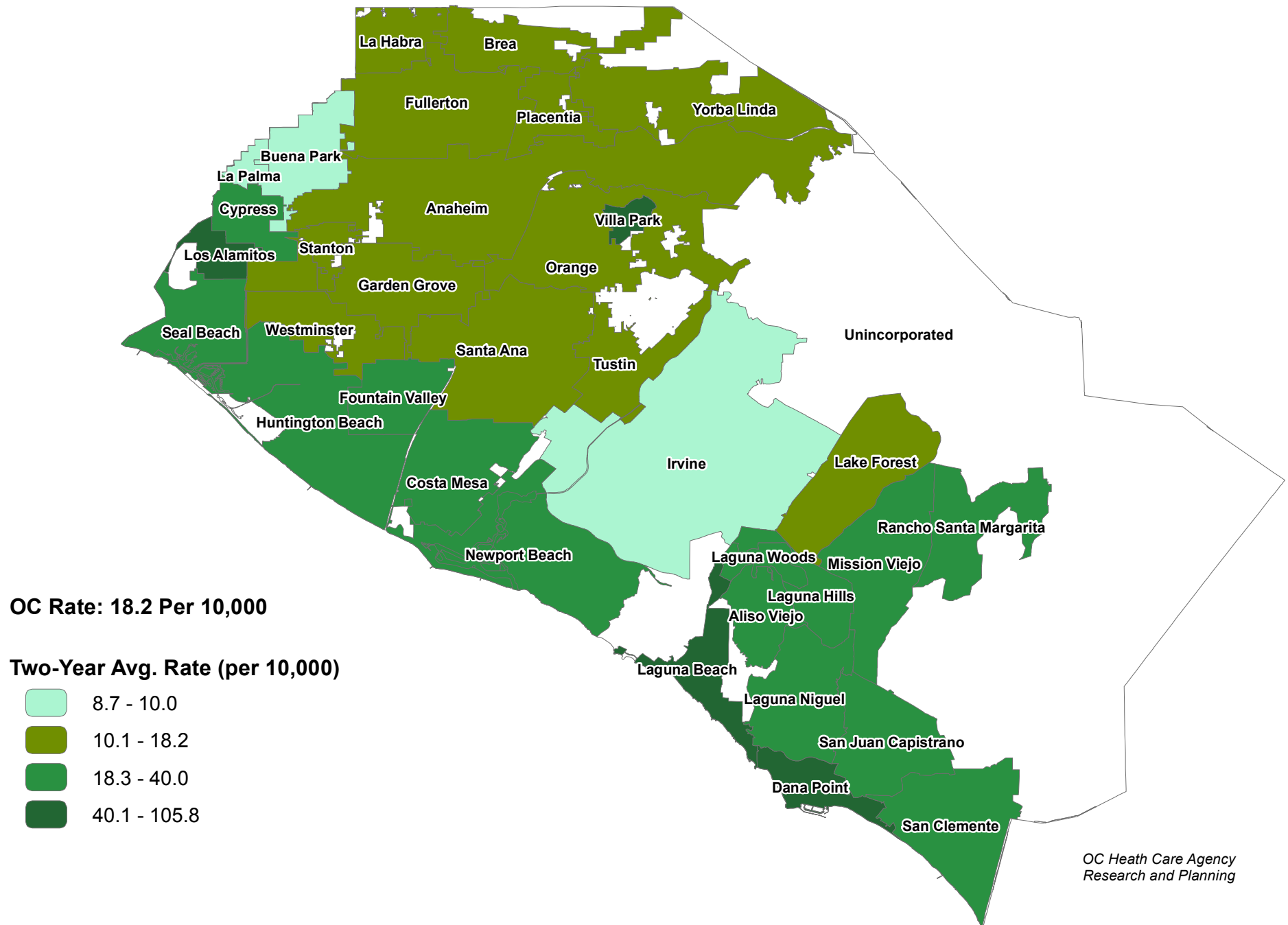
The geographic distribution for drug- and alcohol-related hospitalizations between 2011 and 2012 are presented in **Table 3** and **Map 1**. Slightly more than half (53%, $n = 18$) of Orange County's cities had a hospitalization rate higher than the county-wide rate of 18.2 per 10,000 residents. Importantly, 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 Rates by City (2011-2012)

City	Number 2011	Number 2012	Total 2011-2012	2-Year Avg. Number	2012 Population	2-Year Avg. Rate (per 10,000)
Villa Park	63	62	125	63	5,907	105.8 ¹
Laguna Beach	156	95	251	126	23,131	54.3
Los Alamitos	61	43	104	52	11,639	44.7
Dana Point	157	134	291	146	33,902	42.9
San Clemente	190	211	401	201	64,615	31.0
San Juan Capistrano	115	101	216	108	35,361	30.5
Laguna Woods	55	45	100	50	16,519	30.3
Laguna Niguel	205	180	385	193	64,138	30.0
Mission Viejo	265	263	528	264	94,799	27.8
Newport Beach	215	266	481	241	86,534	27.8
Huntington Beach	462	571	1,033	517	193,836	26.6
Costa Mesa	271	294	565	283	111,482	25.3
Rancho Santa Margarita	104	109	213	107	48,606	21.9
Seal Beach	44	63	107	54	24,514	21.8
Aliso Viejo	87	117	204	102	49,533	20.6
Fountain Valley	104	118	222	111	56,244	19.7
Laguna Hills	49	68	117	59	30,737	19.0
Cypress	104	79	183	92	48,602	18.8
Orange County	5163	5619	10,782	5,391	2,964,736	18.2
Yorba Linda	115	121	236	118	66,512	17.7
Placentia	58	111	169	85	51,900	16.3
Lake Forest	120	134	254	127	78,723	16.1
Anaheim	493	562	1,055	528	346,553	15.2
Westminster	99	162	261	131	91,272	14.3
Brea	57	59	116	58	41,341	14.0
Stanton	45	60	105	53	38,808	13.5
Orange	159	212	371	186	138,913	13.4
Tustin	96	99	195	98	78,071	12.5
Fullerton	168	153	321	161	138,466	11.6
La Habra	70	72	142	71	61,255	11.6
Garden Grove	186	198	384	192	173,182	11.1
Santa Ana	337	381	718	359	330,407	10.9
Buena Park	83	81	164	82	82,035	10.0
La Palma	19	11	30	15	15,836	9.5
Irvine	192	211	403	202	231,363	8.7
Unincorporated	159	173	332	166		

¹ While Villa Park had a sufficient number of cases, the rate should be interpreted with caution given the relatively small population size of this city.

Map 1. Drug- and Alcohol-Related Hospitalization Rates by City (2011-2012)



HOSPITALIZATION CHARGES & LENGTH OF STAY

As summarized in **Table 4**, the 10,782 drug- and alcohol-related hospitalizations in 2011 and 2012 resulted in nearly 50,000 hospital bed-days, with the average length of stay being 4.5 days. On average, each hospitalization stay resulted in about \$25,000 in charges. During this two-year period, total hospitalization charges equaled almost \$270 million.

Table 4. Drug- and Alcohol-Related Hospitalization Charges and Length of Stay (2011-2012)

Total Number of Hospitalizations	10,782
Total Number of Bed-Days	48,934
Average Length of Stay (in Days)	4.5
Total Charges	\$269,435,388
Average Charge per Admission	\$ 24,989

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 (70.1%), as shown in **Table 5**. A smaller percentage of patients were transferred to acute care facilities at another hospital or some other inpatient care (16.6%). Nearly one in ten left the hospital against medical advice (8.9%) and a small percentage died after being admitted to the hospital ($n = 52$, 0.5%).

Table 5. Patient Disposition for Drug- and Alcohol-Related Hospitalizations (2011-2012)

Disposition	Number 2011	Number 2012	Total 2011-2012	Total % 2011-2012
Routine Discharge	3,624	3,935	7,559	70.1%
Acute Care hospital	142	141	283	2.6%
Other Type of Hospital Care (not SN, IC)	554	530	1,084	10.1%
Skilled Nursing/Intermediate or Residential Care	205	216	421	3.9%
Home Health Service	110	137	247	2.3%
Left Against Medical Advice	420	544	964	8.9%
Died	19	33	52	0.5%
Other	89	83	172	1.6%
Total	5,163	5,619	10,782	100.0%

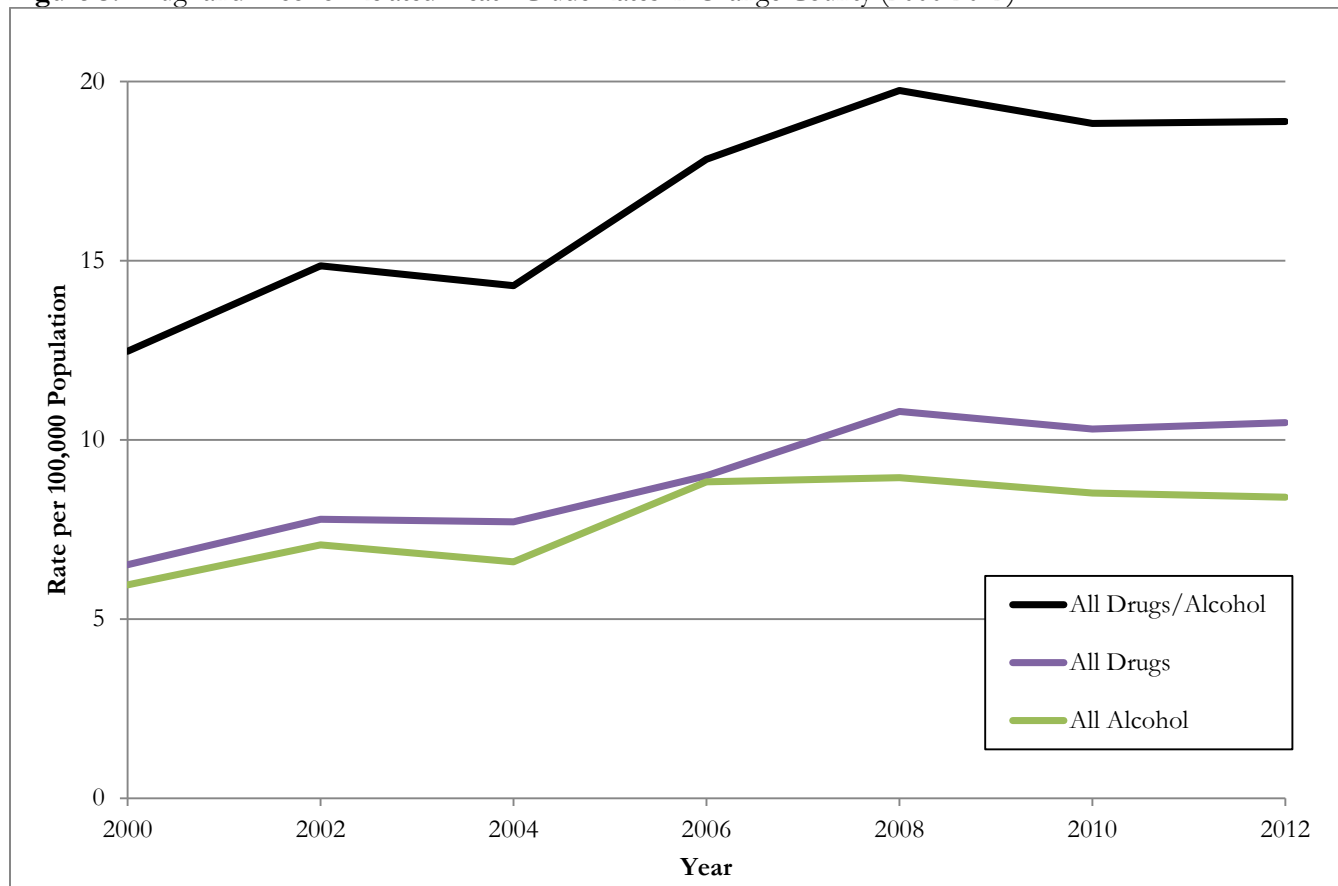
DRUG- & ALCOHOL-RELATED DEATHS: MASTER DEATH FILE & CORONER DATA

This portion of the report used data from the Master Death File 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 Master Death File. 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.

MASTER DEATH FILE DRUG & ALCOHOL OVERDOSE DEATHS

The annual drug- and alcohol-related death rates for Orange County residents between 2000 and 2012 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 by 51% in the last 12 years, from 12.5 per 100,000 in 2000 to 18.9 per 100,000 in 2012. Similarly, the rate of all drug overdose deaths has increased 61% (6.5 vs. 10.5 per 100,000), while all alcohol related deaths increased by 41% during this time period (6.0 vs. 8.4 per 100,000). For the purpose of this report, the most recent findings available from 2011 and 2012 will be examined to determine the types of substances contributing to an overdose death in Orange County.

Figure 3. Drug- and Alcohol-Related Death Crude Rates in Orange County (2000-2012)



ICD-10 CODES: MECHANISMS FOR DRUG USE

In the Master Death File, drug and alcohol overdoses were defined by the underlying cause of death as classified by the *International Classification of Diseases 10th 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 1,156 drug- and alcohol-related overdose deaths recorded in the Master Death File between 2011 and 2012 for all Orange County residents (**Table 6**). The majority of overdose deaths were due to poisoning by drugs, medicinals, and other biological substances ($n = 668$, 57.7%). Of these 668 cases, a large percentage of individuals overdosed after consuming drugs classified as *other drugs and medications*, which typically included cases of poly-drug use, which is the use of multiple substance at one time including, but not limited to, opioids, benzodiazepines, antidepressants, etc. ($n = 408$, 35.5%). A small number and proportion of overdose deaths were attributed to mental or behavioral conditions caused by drug and alcohol abuse ($n = 39$, 3.4%). Almost four in ten of the overdose deaths were due to chronic liver disease(s) or diseases of other organs such as the heart ($n = 449$, 38.9%). 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 ($n = 338$, 29.2%).
2. Accidental overdose from other drugs and medications (e.g., poly-drug use; $n = 288$, 24.9%).
3. Accidental overdose from narcotics and psychodysleptics drugs (e.g., opioids, heroin, cocaine; $n = 114$, 9.9%).
4. Intentional overdose from other drugs and medications (e.g., poly-drug use; $n = 91$, 7.9%).
5. Accidental overdose from sedatives and psychotropic drugs (e.g., antidepressants, benzodiazepines; $n = 70$, 6.1%).

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 ($n = 516$, 77.2%) of all poisoning overdose deaths were accidental, while 18% ($n = 120$) were intentional and in 4.8% ($n = 32$) 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.



Table 6. ICD-10 Codes Categorizing Drug and Alcohol Overdose Deaths (2011-2012)

ICD-10 Code	Cause of Death	Number 2011	Number 2012	Total 2011-2012	Total % 2011-2012
Mental and Behavioral Disorders Due to Drug or Alcohol Consumption (F10.0-F19.9)		23	16	39	3.4%
F10.1	Alcohol – harmful use	4	7	11	1.0%
F10.2	Alcohol – dependence syndrome	10	4	14	1.2%
F10.4	Alcohol – withdrawal state with delirium	1	--	1	0.1%
F10.6	Alcohol – amnesic syndrome	--	1	1	0.1%
F10.7	Alcohol – residual and late-onset psychotic disorder	1	1	2	0.2%
F10.9	Alcohol – unspecified mental and behavioral disorders	1	--	1	0.1%
F11.1	Opioid use – harmful use	1	1	2	0.1%
F19.1	Multiple or psychoactive substances – harmful use	4	2	6	0.5%
F19.9	Multiple or psychoactive substances – unspecified mental & behavioral disorders	1	--	1	0.1%
Organ Complications Due to Alcohol Consumption (I42.6 and K70.0-K70.9)		225	224	449	38.9%
I42.6	Alcoholic cardiomyopathy	4	5	9	0.8%
K70.0	Liver disease – alcoholic fatty liver	6	3	9	0.8%
K70.1	Liver disease – alcoholic hepatitis	7	3	10	0.9%
K70.3	Liver disease – alcoholic cirrhosis of liver	156	182	338	29.2%
K70.4	Liver disease – alcoholic hepatic failure	22	14	36	3.1%
K70.9	Liver disease – alcoholic liver disease, unspecified	30	17	47	4.1%
Poisoning by Drugs, Medicinal, and Biological Substances (X40-X45, X60-X65, and Y10-Y15)		334	334	668	57.7%
<i>Sedatives & Psychotropics (e.g., Antidepressants, Benzodiazepines)</i>		<i>34</i>	<i>58</i>	<i>92</i>	<i>8.0%</i>
X41	Accidental	24	46	70	6.1%
X61	Intentional	8	11	19	1.6%
Y11	Undetermined	2	1	3	0.3%
<i>Narcotics & Psychodysleptics (e.g., Opioids, Heroin, Cocaine)</i>		<i>70</i>	<i>57</i>	<i>127</i>	<i>10.9%</i>
X42	Accidental	64	50	114	9.9%
X62	Intentional	4	4	8	0.6%
Y12	Undetermined	2	3	5	0.4%
<i>Other Drugs & Medications (e.g., poly-drug use)</i>		<i>210</i>	<i>198</i>	<i>408</i>	<i>35.3%</i>
X44	Accidental	142	146	288	24.9%
X64	Intentional	50	41	91	7.9%
Y14	Undetermined	15	8	23	2.0%
X40	Accidental – non-opioid substances	3	2	5	0.4%
X63	Intentional – other drugs acting on autonomic nervous system	--	1	1	0.1%
<i>Alcohol</i>		<i>20</i>	<i>21</i>	<i>41</i>	<i>3.6%</i>
X45	Accidental	18	21	39	3.4%
X65	Intentional	1	--	1	0.1%
Y15	Undetermined	1	--	1	0.1%
TOTAL		582	574	1,156	100.0%

DEMOGRAPHIC DIFFERENCES

Substance abuse has been shown to vary depending on a persons' 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 two-year average rates were calculated to investigate the differences for those who overdosed in 2011 or 2012 (**Table 7** on the following page).

Male residents had twice the rate of overdose deaths due to drugs and alcohol at 24.8 (per 100,000), compared to females (12.7 per 100,000; **Table 7**).

Table 7. Demographic Differences in the Number and Rate of Drug/Alcohol Overdose Deaths (2011-2012)

Table 1. Drug-Related Hospital Inpatient Discharges and Deaths by Age, Sex, Race, Ethnicity, and Cause of Death (2011-2012)													
Characteristics		ICD-10 Code Categories ²								Total 2011-2012	2012 Population ³	2-Year Avg. Number	2-Year Avg. Rate (per 100,000)
		Narcotics & Psychodysleptics Number		Sedatives & Psychotropics Number		Alcohol Number		Other Drugs & Medicaments Number					
		2011	2012	2011	2012	2011	2012	2011	2012				
Gender		2011	2012	2011	2012	2011	2012	2011	2012				
Male		58	41	23	37	187	185	111	116	758	1,527,886	379	24.8
Female		13	17	16	23	75	73	99	82	398	1,562,246	199	12.7
Age ⁴													
15-24		8	8	3	4	1	0	25	18	67	450,230	33.5	7.4
25-34		26	13	4	8	7	8	29	37	132	426,114	66	15.5
35-44		11	9	9	13	27	24	38	31	162	433,717	81	18.7
45-54		19	12	11	25	91	77	65	61	361	450,607	180.5	40.1
55-64		7	13	10	4	80	95	36	35	280	346,114	140	40.4
65-74		0	2	1	3	37	39	8	10	100	209,478	50	23.9
75+		0	1	1	3	19	15	9	6	54	171,877	27	15.7
Race/Ethnicity													
Non-Hispanic White		45	44	28	41	156	164	171	151	800	1,323,800	400	30.2
Hispanic		18	10	8	13	79	76	23	27	254	1,055,225	127	12.0
Asian/Pacific Islander		3	4	2	2	13	11	9	9	53	585,203	26.5	4.5
African American		2	0	0	4	5	3	3	2	19	46,639	9.5	20.4
Other/Unknown		3	0	1	0	9	4	4	9	30	79,265	15	18.9
Total		71	58	39	60	262	258	210	198	1156	3,090,132	578	18.7

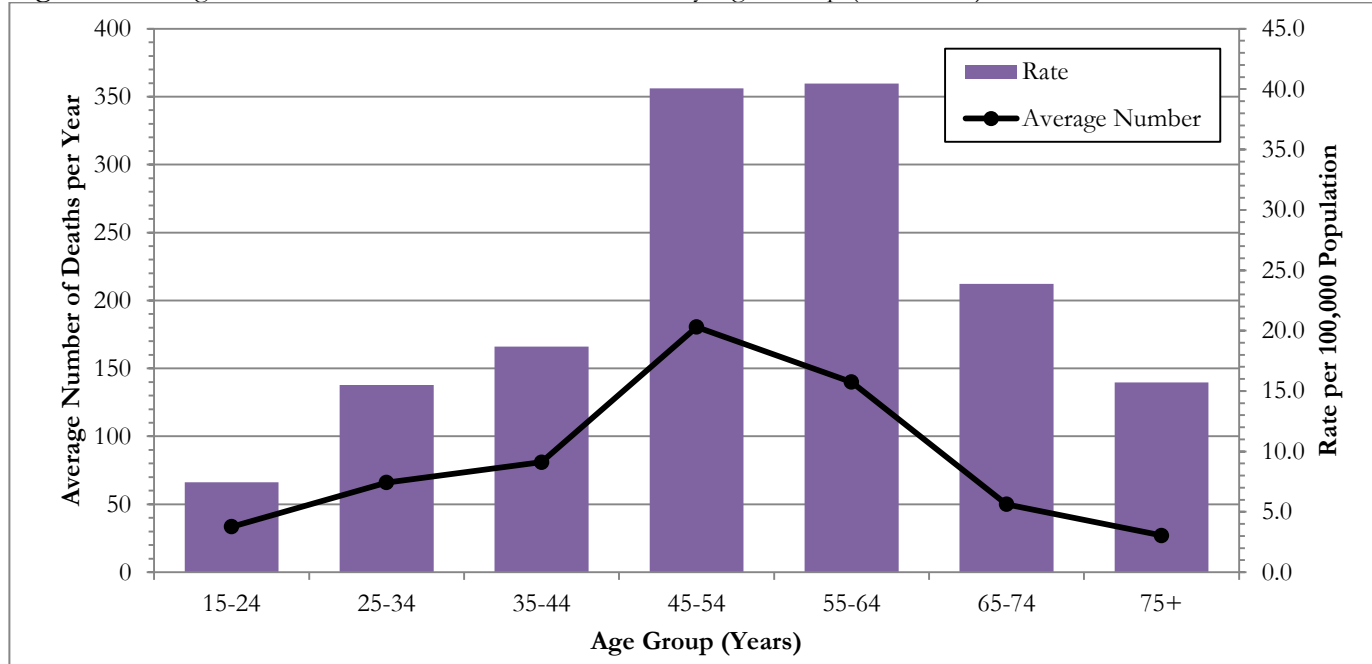
² Narcotics and Psychodysleptics include drugs such as opioids, heroin, methadone, and cocaine; ‘Sedatives and Psychotropics’ include benzodiazepines and barbiturates; and ‘Other Drugs and Medicaments’ include substances such as antidepressants, antihistamines, and amphetamines.

³ Population numbers are from the 2012 American Community Survey, one-year estimates.

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

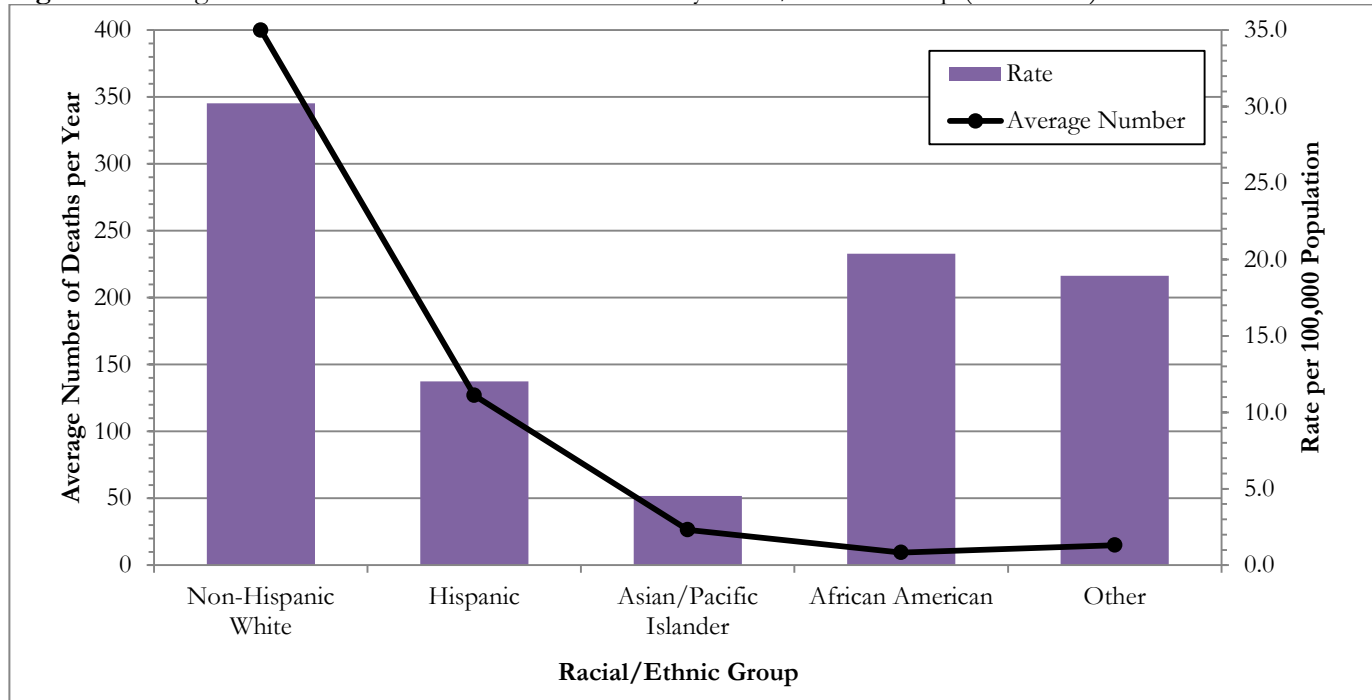
With regard to the age at which people overdosed, individuals between the ages of 45-54 (40.1 per 100,000) and 55-64 (40.4 per 100,000) years had the highest rates of overdose deaths (**Table 6** and **Figure 4**).

Figure 4. Average Number and Rate of Overdose Deaths by Age Group (2011-2012)



Additionally, results examining ethnic group differences revealed that non-Hispanic White residents had the highest rate and average number of drug- and alcohol-related overdose deaths between 2011 and 2012 (30.2; **Table 6** and **Figure 5**). Asian/Pacific Islander residents had the lowest rate in the County (4.5 per 100,000)

Figure 5. Average Number and Rate of Overdose Deaths by Racial/Ethnic Group (2011-2012)



GEOGRAPHY

Table 8 and **Map 2** illustrate the drug- and alcohol-related overdose deaths from 2011 to 2012 for all ages based on the decedents' city of residence.⁵ Green dots on **Map 2** indicate approximate residential location of drug overdose deaths, while yellow dots indicate alcohol-related deaths. Several cities were above the two-year average rate for drug- and alcohol-related death of 19.4 per 100,000 for Orange County ($n = 16$). As shown in **Map 2**, cities with relatively higher overdose deaths tended to include coastal cities followed by south county locales. More specifically, Dana Point had the highest overdose death rate at 33.9 per 100,000, followed by Seal Beach (32.6), and Los Alamitos (30.1). Conversely, the cities with the lowest two-year average mortality rates for drugs and alcohol overdoses included Irvine (8.9), Villa Park (8.5), Aliso Viejo (6.1), and La Palma at 3.2 (per 100,000).

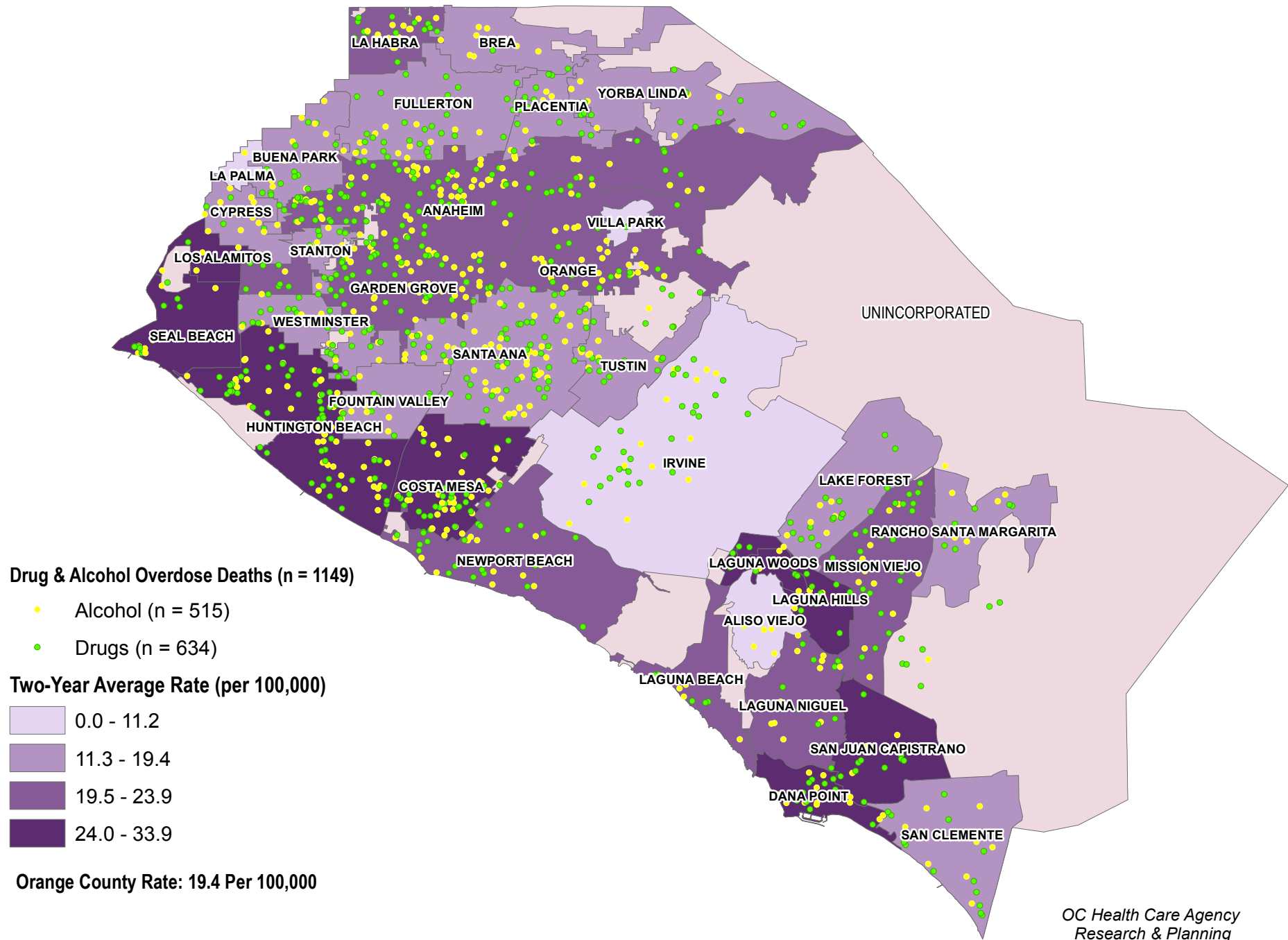
Table 8. Drug and Alcohol Overdose Deaths by City (2011-2012)⁶

City	Alcohol Number	Drugs Number	Total 2011-2012	2-Year Avg. Number	2012 Population	2-Year Avg. Rate (per 100,000)
Dana Point	12	11	23	12	33,902	33.9
Seal Beach	6	10	16	8	24,514	32.6
Los Alamitos	5	2	7	4	11,639	30.1
Laguna Hills	7	11	18	9	30,737	29.3
Costa Mesa	36	28	64	32	111,482	28.7
Laguna Woods	4	5	9	5	16,519	27.2
Huntington Beach	47	56	103	52	193,836	26.6
San Juan Capistrano	5	12	17	9	35,361	24.0
Newport Beach	13	27	40	20	86,534	23.1
La Habra	15	12	27	14	61,255	22.0
Anaheim	71	78	149	75	346,553	21.5
Orange	34	25	59	30	138,913	21.2
Garden Grove	33	37	70	35	173,182	20.2
Mission Viejo	13	24	37	19	94,799	19.5
Laguna Niguel	13	12	25	13	64,138	19.5
Laguna Beach	4	5	9	5	23,131	19.5
Orange County	515	634	1149	575	2,964,736	19.4
Westminster	10	24	34	17	91,272	18.6
Buena Park	14	16	30	15	82,035	18.3
Stanton	5	9	14	7	38,808	18.0
Santa Ana	56	62	118	59	330,407	17.9
Cypress	11	6	17	9	48,602	17.5
Yorba Linda	8	15	23	12	66,512	17.3
Lake Forest	9	18	27	14	78,723	17.1
Tustin	10	16	26	13	78,071	16.7
San Clemente	8	13	21	11	64,615	16.3
Fullerton	12	32	44	22	138,466	15.9
Placentia	6	10	16	8	51,900	15.4
Fountain Valley	9	7	16	8	56,244	14.2
Brea	8	3	11	6	41,341	13.3
Rancho Santa Margarita	5	6	11	6	48,606	11.3
Irvine	14	27	41	21	231,363	8.9
Villa Park	0	1	1	1	5,907	8.5
Aliso Viejo	6	0	6	3	49,533	6.1
La Palma	1	0	1	1	15,836	3.2
Unincorporated	5	14	19	10		

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

⁶ Population numbers are one-year estimates from the 2012 California Department of Finance Demographic Research Unit.

Map 2. Drug and Alcohol Overdose Deaths by City (2011-2012)



CORONER INVESTIGATED DRUG & ALCOHOL OVERDOSE DEATHS

In addition to analyzing information from both hospitals and the Master Death File, data from the Orange County Sheriff's Department, Coroner Division were assessed. These data include the specific type of drugs involved (i.e., illicit drugs, prescription medication, mixtures, other drugs) in the deaths and the intent of use (i.e., accident, suicide; $N = 963$). To better understand the latest trends in drug- and alcohol-related overdose deaths that were investigated by the Coroner, the most recent data available—specifically for 2013—were included in addition to 2011 and 2012 data. 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 analyses. Also, non-Orange County resident deaths that were investigated by the Coroner were excluded from this analysis. The results in this section reflect matched cases between the Master Death File and the Coroner's data (**Table 9**). Additionally, because the Coroner's data is a sub-set 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 Master Death File, in some cases, drugs may have been consumed with other types of illicit or prescription substances, in addition to alcohol.

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

Source	Number 2011	Number 2012	Number 2013	Total 2011-2013	Average Number per Year
Master Death File	582	574	N/A	1,156	578
Coroner	302	307	354	963	321

Between 2011 and 2013, the Coroner investigated 963 drug overdose deaths: 54.2% percent of cases involved a prescription drug overdose, while 21.1% involved illicit substances (**Table 10**). In many cases the decedents used a mixture of alcohol, illicit, or prescription drugs prior to overdosing (18.9%), and in 5.6% of cases, alcohol alone was the primary contributor to an individual's death. Overdose deaths by prescription and illicit drugs increased over the course of this three-year period, while deaths due to mixtures and alcohol substances remained level.

Table 10. Total Number of Deaths per Year by Type of Drug Used (2011-2013)⁷

	Number 2011	Number 2012	Number 2013	Total 2011-2013	Total % 2011-2013
Prescription Drugs	169	171	182	522	54.2%
Illicit Drugs	61	53	89	203	21.1%
Mixture	55	64	63	182	18.9%
Alcohol	17	18	19	54	5.6%
Other	0	1	1	2	0.2%
Total	302	307	354	963	100.0%

TYPE & INTENT OF DRUG USE

Over the course of this three-year period, the number of accidental and intentional overdose deaths increased 23%, with the increase occurring primarily between 2012 and 2013 (**Table 11**). Similar to results found in the Master Death File, the majority of deaths investigated were due to accidental overdoses (78.6%). Roughly 18% of all overdoses deaths were ruled intentional (17.4%), while in 3.9% of all cases the intent was undetermined.

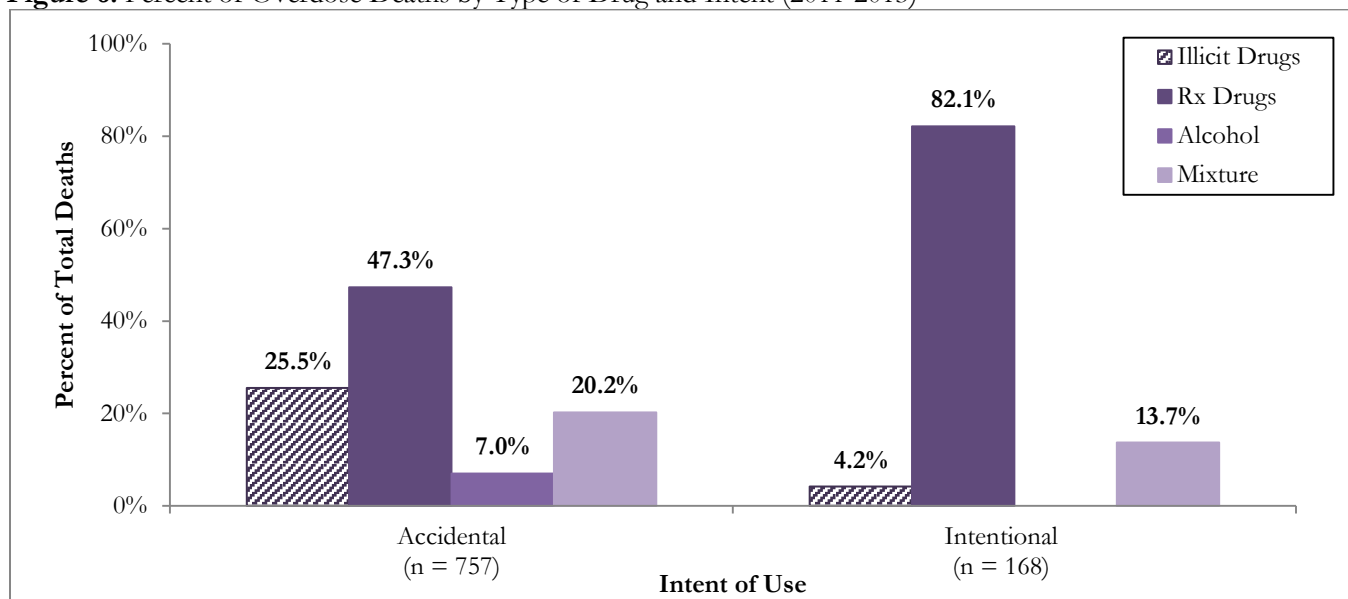
Table 11. Number of Overdose Deaths by Intent of Drug Use (2011-2013)

	Number 2011	Number 2012	Number 2013	Total 2011-2013	Total % 2011-2013
Accidental	229	250	278	757	78.6%
Intentional	53	46	69	168	17.4%
Undetermined	20	11	7	38	3.9%
Total	302	307	354	963	100.0%

⁷ Throughout this section of the report, no interpretations were provided for other classes of drugs due to the small sample sizes.

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 (82.1%). Roughly half (47.3%) of those who accidentally overdosed also used prescription medication, while a quarter (25.5%) used illicit drugs and one in five (20.2%) individuals used a mixture of substances.

Figure 6. Percent of Overdose Deaths by Type of Drug and Intent (2011-2013)



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 ($N = 963$), 70% 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 (83%, $n=562$ of 674) were classified as poly-drug, while 17% ($n=112$) were opioid only deaths. Benzodiazepines were the most common drugs used in combination with opioids (36%). The other commonly used substances either alone or in combination with other drugs included benzodiazepines (43%), alcohol (29%), antidepressants (28%), and amphetamines (21%).

Table 12. Number of Annual Deaths by Major Drug Categories and Combinations (2011-2013)⁸

	Number 2011	Number 2012	Number 2013	Total 2011-2013	Total % 2011-2013	3-Year Avg. (per 100,000)
Opioid	224	209	241	674	70%	224.7
Benzodiazepine	130	142	146	418	43%	139.3
Alcohol	95	86	99	280	29%	93.3
Antidepressants	85	85	99	269	28%	89.7
Amphetamines	44	78	82	204	21%	68
Antihistamines	60	44	63	167	17%	55.7
Cocaine	13	7	9	29	3%	9.7
Barbiturates	4	6	3	13	1%	4.3

⁸ Drug categories are not mutually exclusive. Therefore, the total number for these cases will be greater than the total number of overdose deaths investigated by the Coroner ($N = 963$).

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 three-year period, 59.1% of all opioid-related overdose deaths were categorized as prescription opioid medication overdoses (**Table 13**). Roughly seventeen percent (17.2%) of all opioid-related overdose deaths were caused by illicit substances, specifically heroin.

Table 13. Opioid-Related Overdose Deaths Investigated by the Coroner (2011-2013)

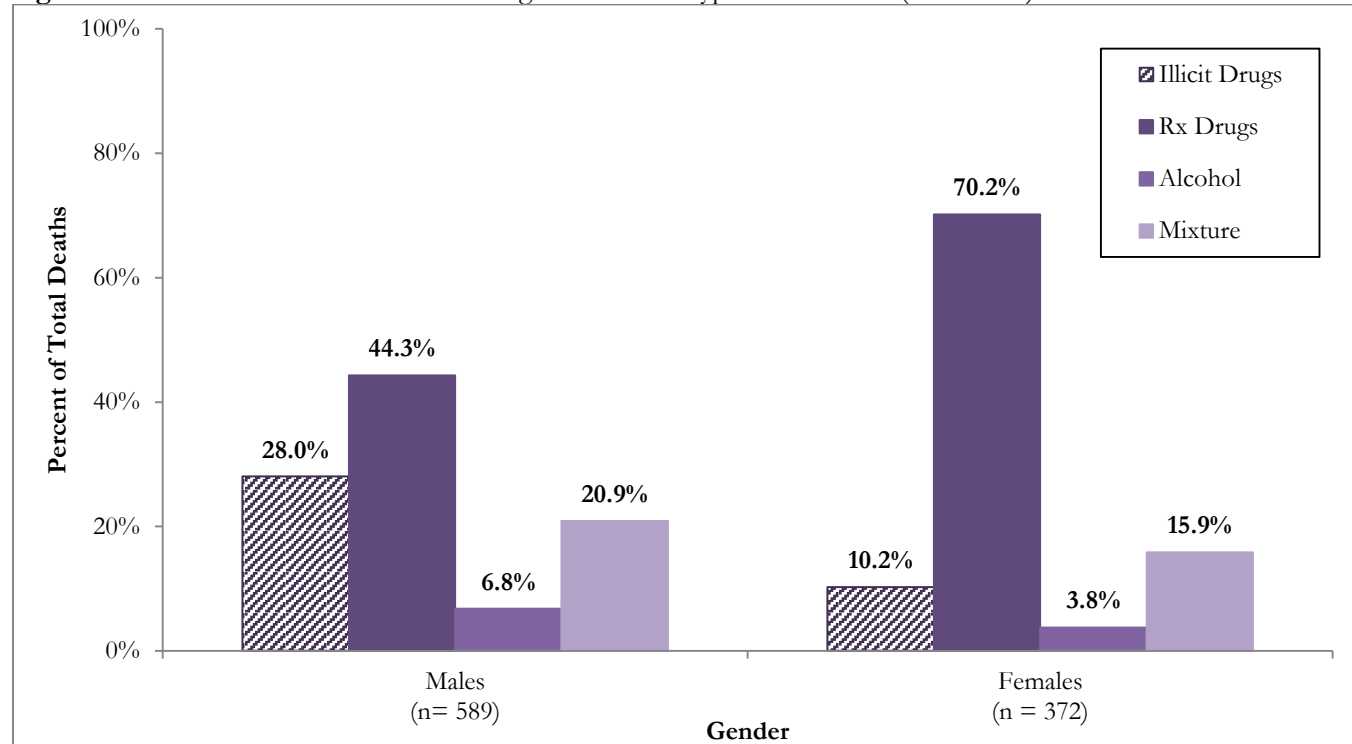
	Number 2011	Number 2012	Number 2013	Total 2011-2013	Total % 2011-2013
Prescription Opioids	129	130	139	398	59.1%
Mixture	48	56	56	160	23.7%
Illicit Opiates (e.g., heroin)	47	23	46	116	17.2%
Total	224	209	241	674	100.0%

DEMOGRAPHIC PROFILES

Gender

Between 2011 and 2013, females were 1.5 times more likely to overdose from prescription medication compared to males (**Figure 7**). For males, 44.3% of all substance overdoses deaths were due to prescription (Rx) drugs, while 28% were due to illicit drugs, and 20.9% were due to a mixture of prescription medication, illicit drugs, or alcohol. Additionally, women overdosed less frequently from illicit (10.2%), mixtures (15.9%), or alcohol (3.8%) compared to males.

Figure 7. Gender Profile of Coroner-Investigated Deaths: Type of Substance (2011-2013)



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

Figure 8. Gender Profile of Coroner-Investigated Deaths: Intent (2011-2013)



When examining the gender profile of decedents and the specific substance(s) used by intent, both males (78%) and females (85.9%) were likely to use prescription medication prior to an intentional overdose death, while very few used illicit drugs (**Figure 9**). Additionally, males and females were equally likely to use a mixture of substances to overdose, regardless of intent. In the cases of accidental overdoses, males (31.9%) were twice as likely as females (13.6%) to have used illicit substances, yet females were more likely to accidentally die after using prescription medication compared to males (64.5% vs. 38%).

Figure 9. Gender Profile of Coroner-Investigated Deaths: Intent by Substance (2011-2013)

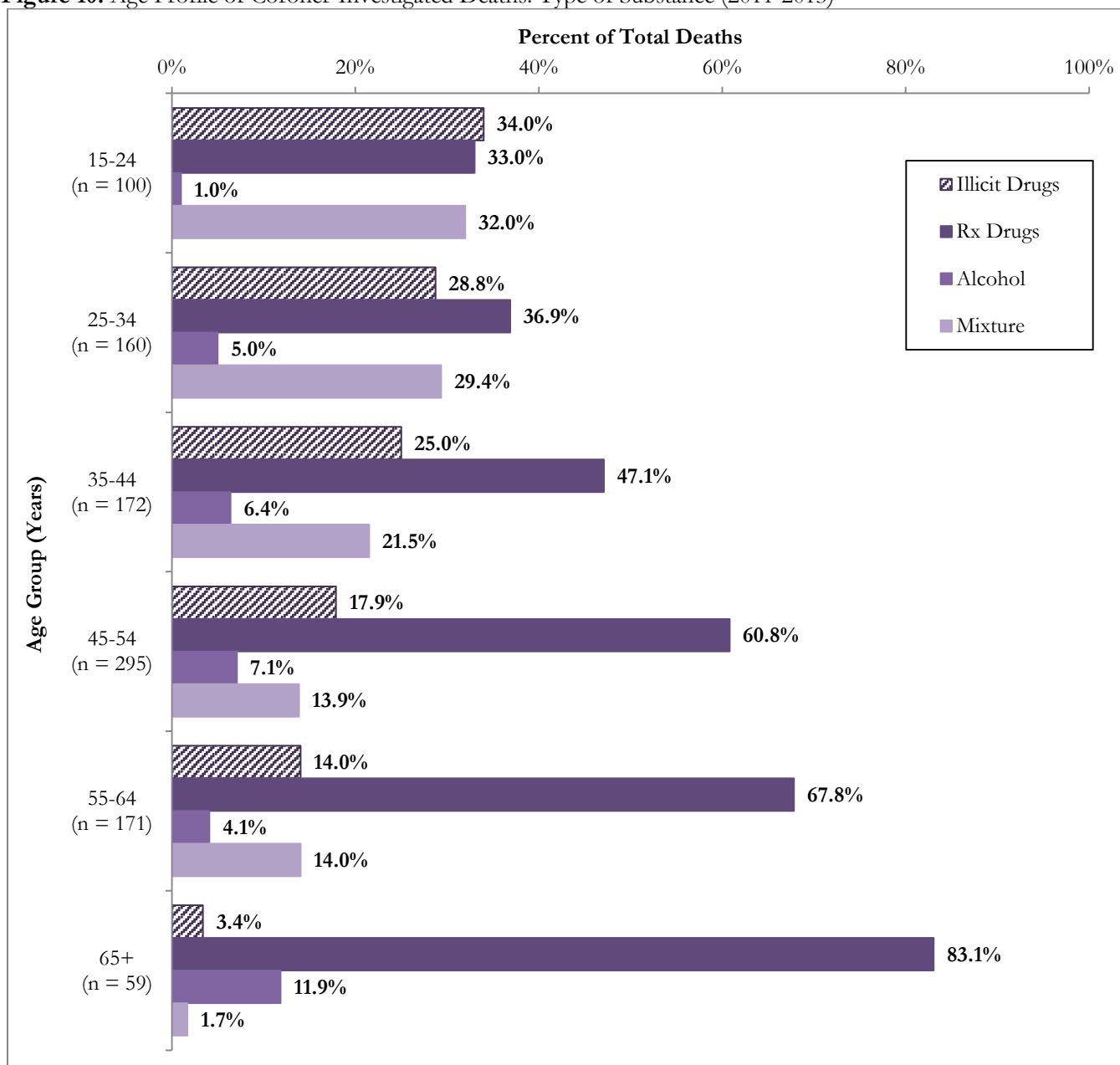


Age

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 medication increased as residents aged, while the percent of overdose deaths involving illicit drugs and mixtures decreased with age.

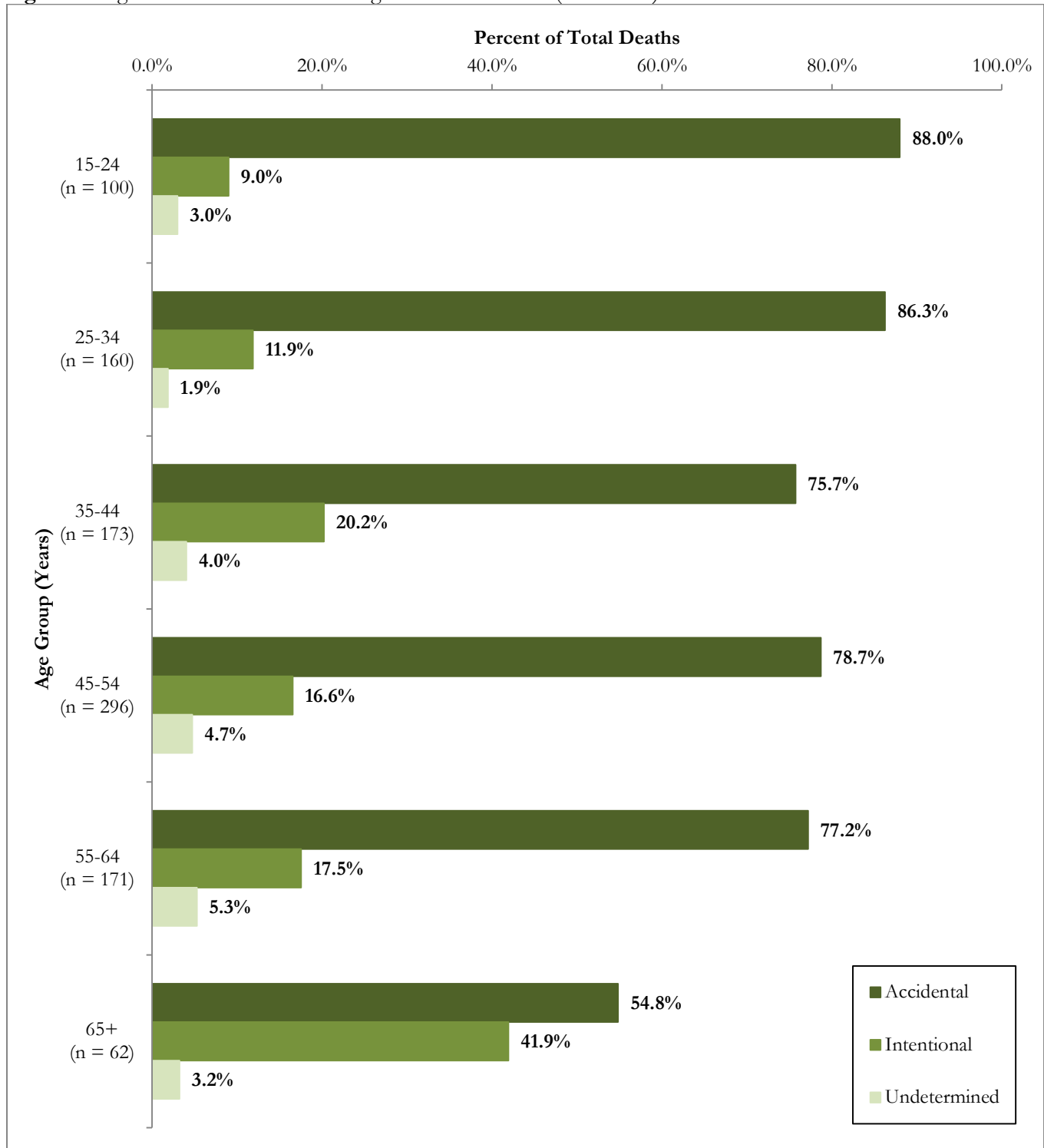
Between 2011 and 2013, the majority of residents used prescription medication prior to an overdose death, and this was especially true for those over the age of 45. More specifically, after age 44, prescription drugs were the predominant drug type leading to an overdose death, and this was almost exclusive among residents over the age of 65 (83.1%). Among decedents 44 years and younger, prescription medication, illicit, and a combination of substances fairly equally contributed to overdose deaths.

Figure 10. Age Profile of Coroner-Investigated Deaths: Type of Substance (2011-2013)



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 overdosed accidentally. However, among residents 65 years of age and older, a large proportion (41.9%) of overdose deaths were ruled intentional. It is possible that these findings are due the fact that this age group is more likely to experience chronic or terminal illnesses at the end of life as has been documented elsewhere (Chima, 2002).

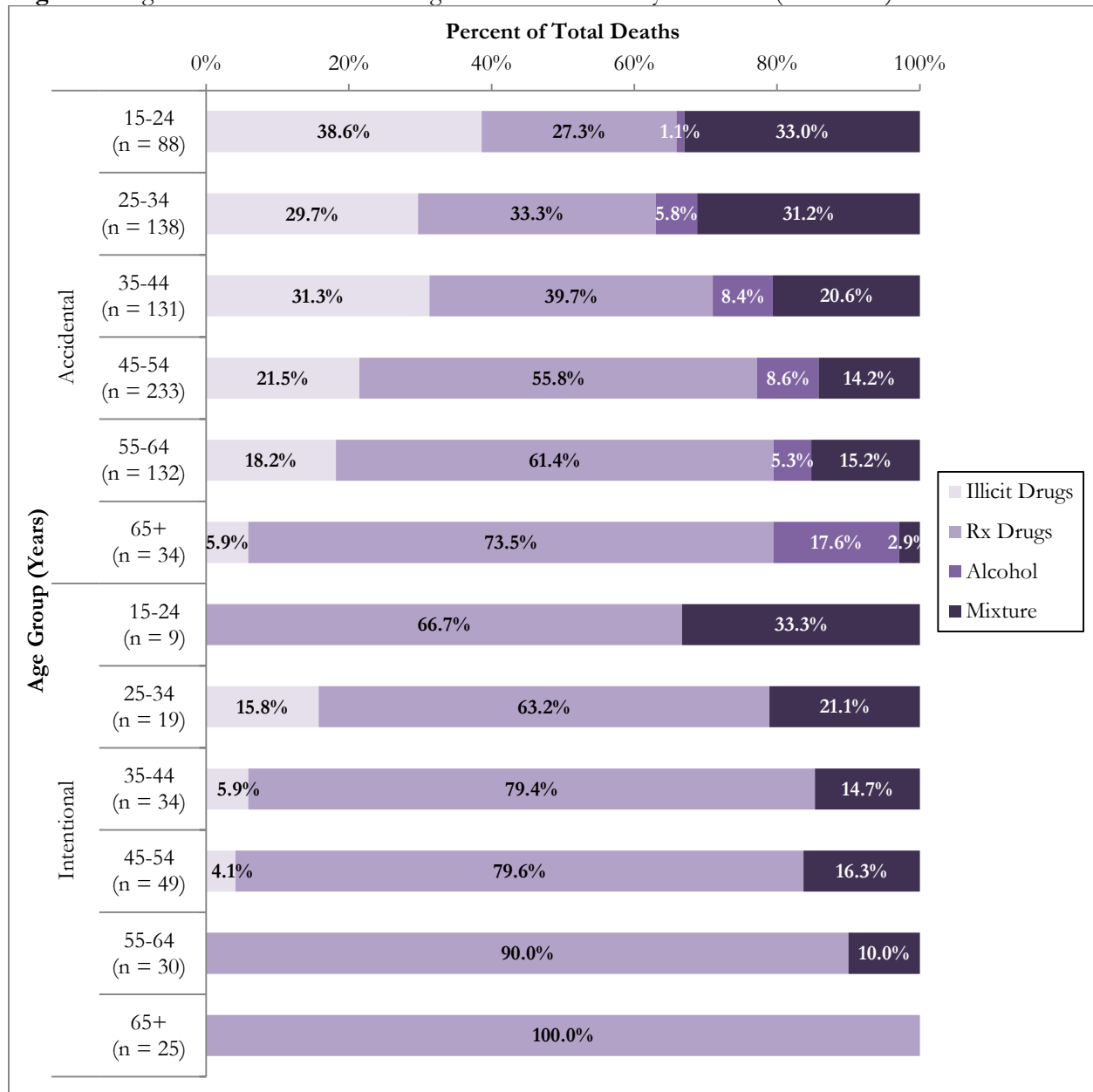
Figure 11. Age Profile of Coroner-Investigated Deaths: Intent (2011-2013)



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 this is especially true in instances of intentional overdoses (**Figure 12**). More than 60% of all intentional overdoses in each age group were attributed to prescription drug abuse and the percentage increased systematically with age. Among Orange County residents, accidental overdoses due to prescription medication also increased with age, while accidental overdose deaths due to illicit substances decreased. This was especially true for those after the age of 44.

Middle age adults (45-64) and older adults (65+) were more likely to intentionally overdose using prescriptions, with 79.6% of adults between the ages of 45-54, 90% of 55-64 year olds, and 100% of adults over the age of 65 using this type of substance. Young (25-34) to middle (35-54) age residents were the only cases of intentional overdose deaths due to illicit substances. Additionally, youth (15-24) and young adults (25-44) equally used prescription medication, illicit drugs, or a combination of drugs and alcohol prior to an accidental overdose.

Figure 12. Age Profile of Coroner-Investigated Deaths: Intent by Substance (2011-2013)

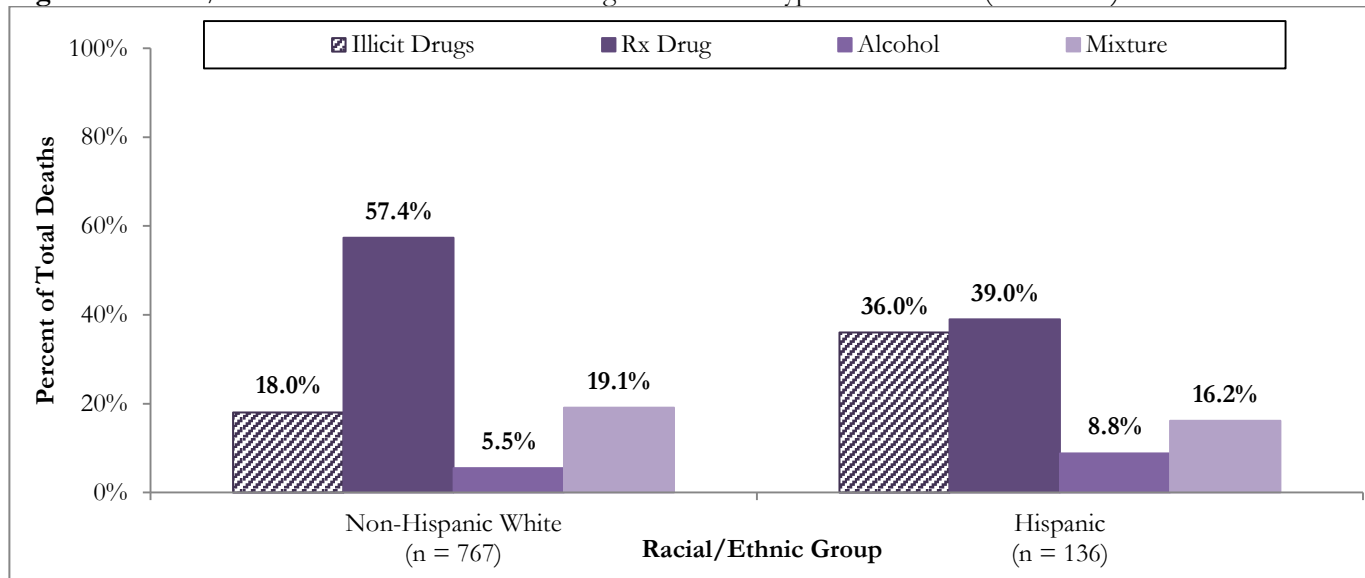


Race & Ethnicity

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 the small sample sizes.

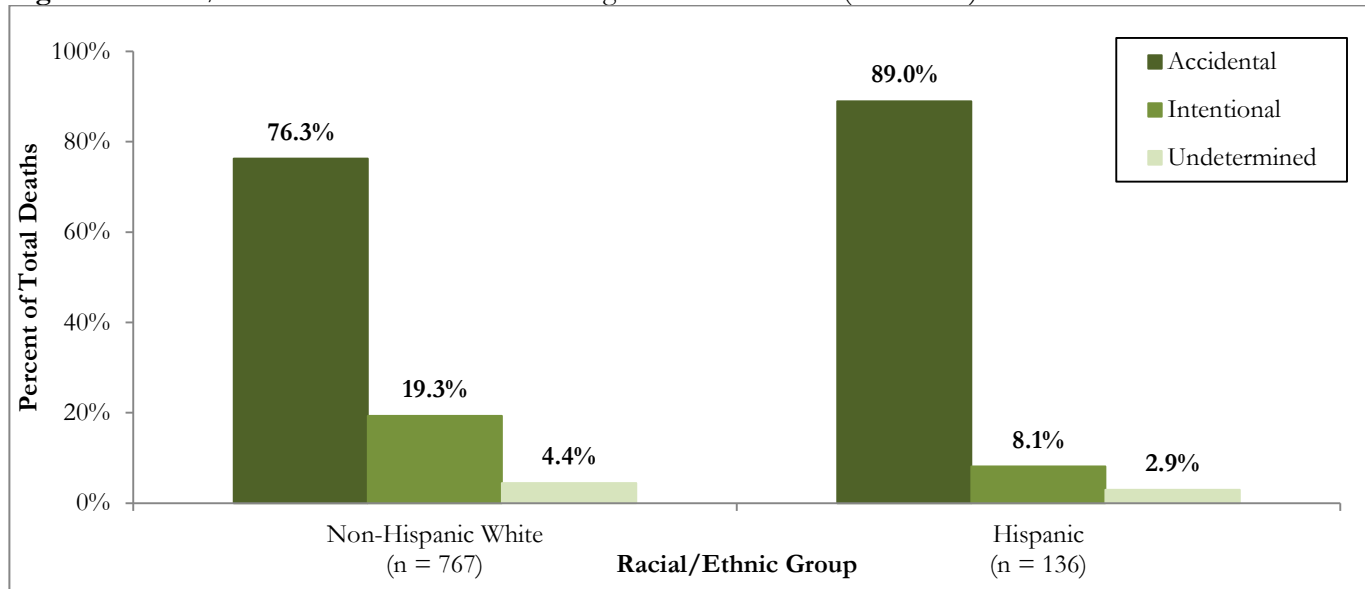
Hispanic residents were twice as likely to die from an illicit drug overdose, compared to non-Hispanic Whites (**Figure 13**). Specifically, 36% of all substance-related overdose deaths among Hispanics were from illicit drugs, while only 18% of all deaths among non-Hispanic Whites were due to these types of drugs. Additionally, over half of all non-Hispanic Whites (57.4%) and about one in four Hispanic residents (39%) died from prescription medication overdose.

Figure 13. Racial/Ethnic Profile of Coroner-Investigated Deaths: Type of Substance (2011-2013)



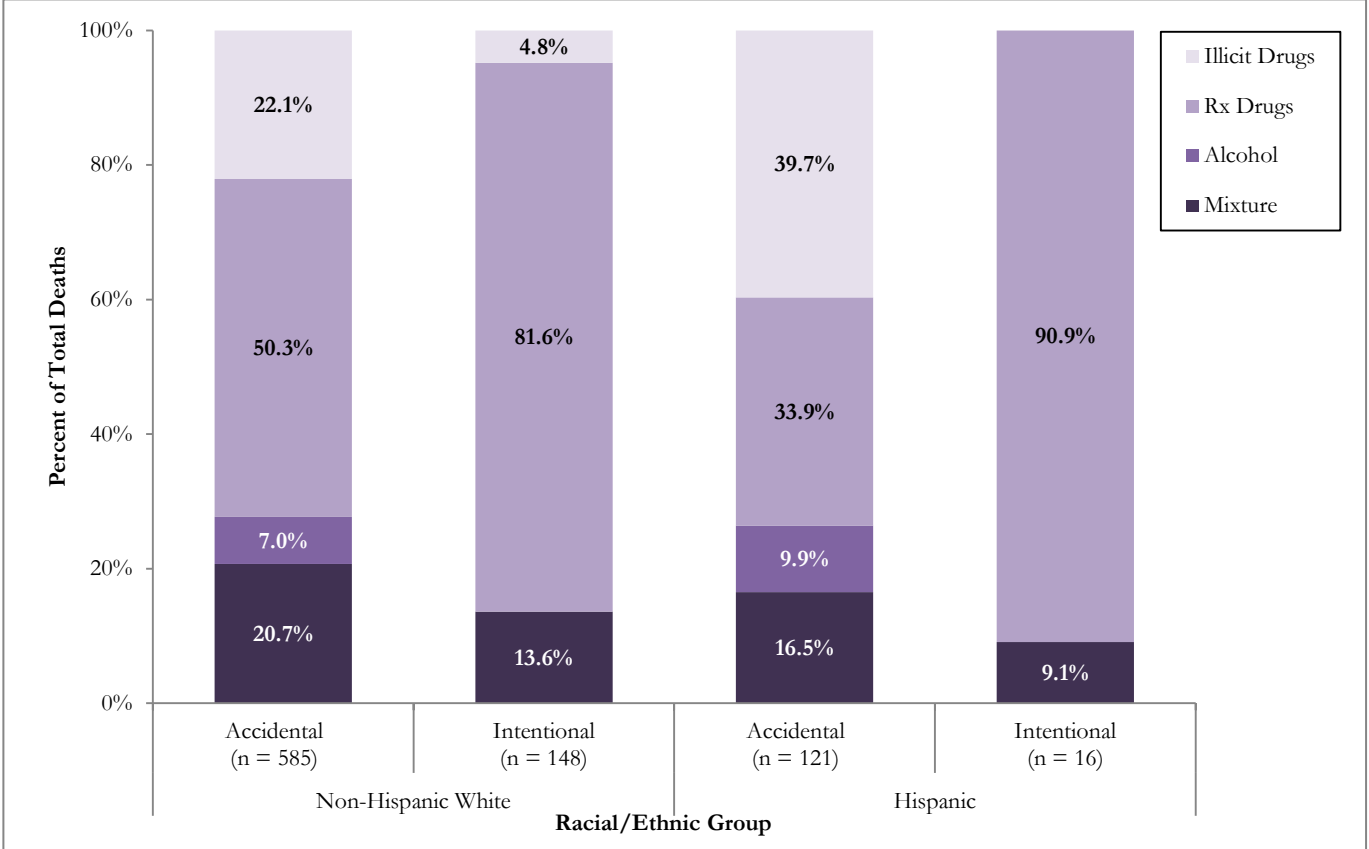
Drug- and alcohol-related overdose deaths frequently occurred by accident among non-Hispanic White and Hispanic residents (**Figure 14**). While 76.3% of all substance-related deaths among non-Hispanic Whites were accidental, 89% of all overdose deaths among Hispanics were accidental. Non-Hispanic Whites were more than twice as likely to intentionally use drugs and/or alcohol to commit suicide compared to Hispanic residents.

Figure 14. Racial/Ethnic Profile of Coroner-Investigated Deaths: Intent (2011-2013)



When examining the intent of use by the type of substance used (**Figure 15**), intentional overdoses were largely attributed to prescription medication for both non-Hispanic Whites (81.6%) and Hispanics (90.9%). However, non-Hispanic Whites were 1.5 times as likely to accidentally overdose after consuming prescription drugs (50.3%), compared to Hispanics (33.9%). Roughly one quarter (22.1%) of all accidental deaths among non-Hispanic Whites was due to illicit substances, while almost four in ten (39.7%) Hispanics accidentally died from these types of drugs.

Figure 15. Racial/Ethnic Profile of Coroner-Investigated Deaths: Intent by Substance (2011-2013)



GEOGRAPHY

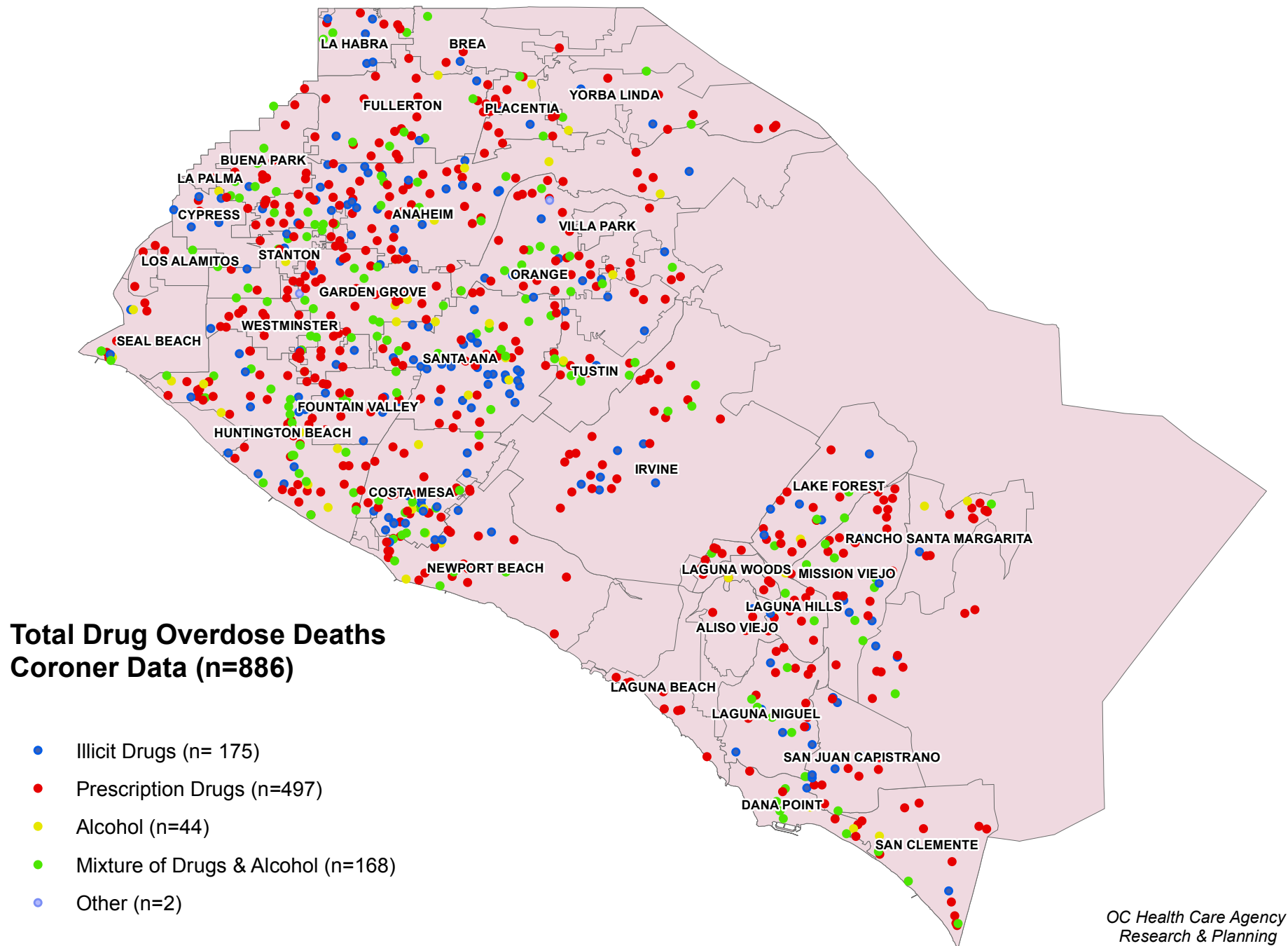
Several cities in the northern and central Orange County regions reflected a higher frequency of Coroner-investigated drug- and alcohol-related overdose deaths⁹ (see **Table 14** and **Map 3**). Blue dots in **Map 3** correspond to instances of illicit drug overdoses and red dots are related to occurrences of prescription drug overdose deaths. The map on the following page also presents information regarding the location of alcohol overdoses presented in yellow, mixtures of drugs and/or alcohol presented in green, as well as other types of drugs which are notated as light blue dots. Of those whose addresses were provided by the Coroner's office, individuals living in Anaheim ($n = 109$), Santa Ana ($n = 82$), Huntington Beach ($n = 80$), and Costa Mesa ($n = 50$) were more likely to have occurrences of drug or alcohol overdose deaths. The Orange County Coroner does not typically investigate deaths due to alcohol abuse and thus the total number ($n = 44$) is relatively small in this dataset.

Table 14. Number of Drug and Alcohol Overdose Deaths Coroner-Investigated Deaths by City (2011-2013)

	Illicit Drugs Number	Prescription Drugs Number	Alcohol Number	Mixture of Alcohol & Drugs Number	Other Number	Total Number
Anaheim	27	62	5	15	0	109
Santa Ana	32	31	5	14	0	82
Huntington Beach	12	41	7	20	0	80
Costa Mesa	14	21	4	11	0	50
Orange	7	28	1	11	1	48
Garden Grove	6	27	3	8	1	45
Fullerton	4	23	1	5	0	33
Mission Viejo	5	20	0	7	0	32
Irvine	6	22	0	3	0	31
Newport Beach	5	19	2	5	0	31
Westminster	3	23	0	3	0	29
Lake Forest	5	16	2	5	0	28
Laguna Niguel	7	12	0	6	0	25
Buena Park	2	11	0	7	0	20
San Clemente	1	14	1	3	0	19
Tustin	2	8	1	7	0	18
Unincorporated	3	10	0	5	0	18
Fountain Valley	4	9	0	4	0	17
San Juan Capistrano	7	9	0	1	0	17
Laguna Hills	1	10	1	3	0	15
Yorba Linda	2	9	1	3	0	15
Seal Beach	2	6	2	4	0	14
Rancho Santa Margarita	1	10	2	0	0	13
Stanton	2	7	1	3	0	13
Cypress	6	3	1	2	0	12
Dana Point	1	4	2	5	0	12
La Habra	5	5	0	2	0	12
Placentia	1	7	1	2	0	11
Laguna Woods	0	8	1	0	0	9
Laguna Beach	0	8	0	0	0	8
Aliso Viejo	1	5	0	0	0	6
Brea	1	3	0	2	0	6
Los Alamitos	0	4	0	1	0	5
Unknown Cities	0	1	0	1	0	2
La Palma	0	1	0	0	0	1
Villa Park	0	0	0	0	0	0
Total	175	497	44	168	2	886

⁹ Addresses were not available for all decedents and were not included in this analysis.

Map 3. Coroner - Investigated Drug and Alcohol Overdose Deaths by City (2011-2013)



DISCUSSION & NEXT STEPS

Each year in Orange County, drug and alcohol overdoses, or poisonings, result in over 5,000 hospitalizations and nearly 600 deaths. While it is very difficult to measure the social and economic costs involved in these types of deaths, the abuse of such substances led to about 25,000 bed-days and \$135 million in hospitalization charges annually. The overall mortality rates from all drug and alcohol poisoning have systematically increased 51% between 2000 and 2012 in Orange County. Specifically, the rate of drug overdose deaths alone has increased 61%, and alcohol-related deaths increased 41% during this same time period. Moreover, the most common causes of substance-related deaths included cirrhosis; accidental and intentional overdoses from poly-drug use; accidental overdoses from narcotics and psychodysleptics (e.g., opioids, heroin, cocaine); and accidental overdoses from sedatives (e.g., benzodiazepines).

Importantly, more than half (54%) of all drug- and alcohol-related hospitalizations involved drugs, while the remaining cases involved alcohol (46%). In a 2012 survey, an estimated 38,000 Orange County residents misused prescription medication within the past year (Alcohol and Drug Use Prevalence, 2014). Opioid drugs were identified in the current report as the most frequently used substance in the Coroner's investigations; specifically, 70% of all overdose deaths investigated involved opioid-like substances. Moreover, 36% of all overdose deaths investigated by the Coroner used opioid substances in combination with benzodiazepines, which is a particularly lethal mixture that reduces a person's ability to breathe.

Notably, similar to results found in the Master Death File, the overwhelming majority (78.6%) of overdose deaths investigated by the Coroner were ruled accidental, while 17.4% that were ruled intentional. Similar to what has been reported nationally (CDC, 2013), over half of all drug overdose deaths in Orange County were due to prescription medications (54.2%). Additionally, 82% of all *intentional* overdoses involved prescription drugs, while 47% of *accidental* overdoses involved these substances and a quarter of all accidental overdoses involved illicit drugs. There were also differences in the demographic profiles for the types of substances used prior to overdose, as well as the intent behind an individual's substance use.

GENDER

Males were nearly two times more likely to be hospitalized for or die from a drug- or alcohol-related incident compared to females. Coroner-investigated cases revealed, compared to males, females were twice as likely to intentionally overdose (23% vs. 14%), and were more likely to use prescription medication prior to an accidental overdose death. In contrast, males were more likely to accidentally or intentionally overdose using illicit drugs compared to females.

AGE GROUPS

Rates of hospitalization due to overdose were highest among adults ages 25-64 years, and overdose deaths were most prevalent among adults ages 45-74 years. Residents between the ages of 45-64 years of age were at the highest risk to die from an overdose, with this age group having some of the highest rates of both hospitalization and death due to a substance-related overdose.





Three-quarters of all overdose deaths among those under the age of 65 years were ruled accidental. While only 55% of overdose deaths among residents 65 years and older were ruled accidental, 42% were ruled intentional overdoses. Notably, people in this age group exclusively used prescription drugs in an intentional overdose. Moreover, residents between the ages of 15-44 years were more likely to use illicit, prescription, or a mixture of substances during an accidental overdose and adults over 45 years of age primarily used prescription medication regardless of intent.

RACE & ETHNICITY

The highest rates of hospitalization and overdose deaths were among non-Hispanic White residents, while the lowest rates were seen for Asian/Pacific Islanders. Hispanic residents were more likely, compared to non-Hispanic Whites, to overdose from illicit substances, especially in cases of an accidental overdose. In contrast,

non-Hispanic Whites were more likely to accidentally overdose on prescription drugs. Non-Hispanic Whites and Hispanics had similar profiles in terms of the types of drugs used during an intentional overdose. Specifically, both groups were most likely to use prescription drugs to intentionally overdose.

GEOGRAPHY

Geographically, cities along the coastal regions of Orange County tended to have higher rates of drug- and alcohol-related hospitalizations and deaths than other cities. Data from the Coroner revealed that a large number of drug-related deaths occurred in the more populous cities such as Anaheim, Santa Ana, Huntington Beach, and Costa Mesa.

CONCLUSION

Our report of Orange County is consistent with the findings from previous research that reported the majority of drug overdose deaths were accidental, and primarily involved the misuse of prescription medications (Chen et al., 2014; Jones, et al., 2010; Okie, 2010). Factors that may contribute to abuse of such substances include physicians who inappropriately prescribe, counsel, or fail to monitor patients drug behaviors; patients' lack of knowledge regarding proper use of prescription medication; patients' sharing medication with relatives or friends; and patients' obtaining prescriptions from multiple doctors, otherwise known as "doctor shopping" (Okie, 2010). Monitoring for potential risk factors is vital to reduce accidental poisonings, hospitalizations, and overdose deaths. This report highlights the demographic profiles of those who may be more likely to abuse prescription, illicit, and/or alcohol substances. Consistent with these findings, a 2012 alcohol and drug use survey of Orange County adults found that prescription pain medication was the most common type of medication misused in the past year or during their lifetime (Alcohol and Drug Use Prevalence, 2014). This could explain the rise in prescription drug overdose deaths among middle age and older adults found in this report. Considering this information, it is important to continue targeting intervention efforts toward males, as well as middle age and older adults' to decrease instances of drug-related morbidity and mortality in Orange County. Programs should also be geared toward increasing awareness of proper prescription drug behaviors to all residents, especially females and adults. These findings will help to inform prevention and intervention efforts in Orange County by identifying individuals who may be at risk for drug and alcohol abuse, overdose, and/or death.

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/ch/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).

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