

A 10-Year Review of Opioid-Related Deaths at West Tennessee Regional Forensic Center: 2007-2017

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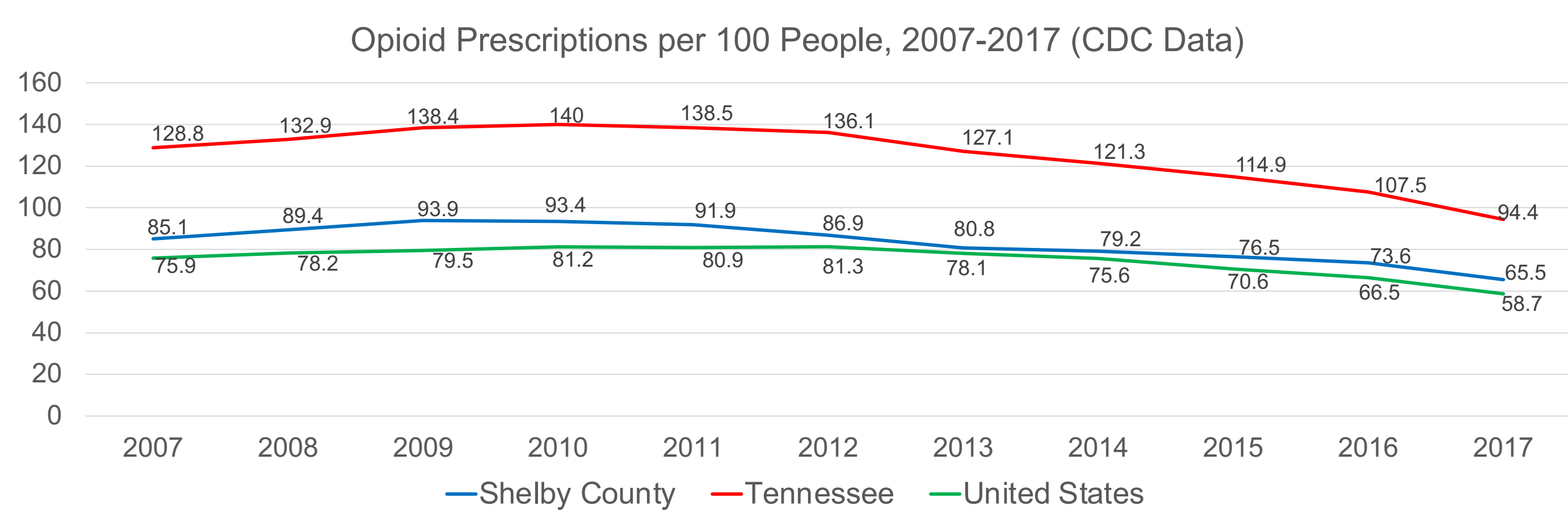
ABSTRACT

Prescription opioid deaths have tripled since 1999, and currently opioid overdose kills 115 Americans per day on average (1). Prior to 2014, prescription opioids have been the primary driver of opioid-related mortality. In recent years, the United States has seen a steady decline in the rate of opioid prescription. At the same time, there has been a significant increase in the number of deaths attributed to non-prescription opioids such as heroin, illicitly manufactured fentanyl, and fentanyl analogues. In 2017, among 70,237 drug overdose deaths nationally, 47,600 (67.8%) involved opioids, with increases across age groups, racial/ethnic groups, and county urbanization levels in multiple states (2). The opioid epidemic is especially profound in Tennessee, which had the 3rd highest opioid prescription rate in the country in 2017 and an opioid-related death rate of 19.3 deaths per 100,000 persons, compared to the national average of 14.6 (3).

This retrospective study analyzes autopsy data from West Tennessee Regional Forensic Center (WTRFC) from 2007 to 2017 to gain a better understanding of the effects of the opioid epidemic on West Tennessee and the surrounding areas. Data from opioid-related accidents and suicides were analyzed in order to identify trends in race, age, gender, location, types of opioids, and drug combinations involved in opioid-related deaths.

INTRODUCTION

The West Tennessee Regional Forensic Center is located in Memphis, Tennessee and investigates approximately 4,000 deaths per year for Shelby County and 13 other counties west of the Tennessee River. Shelby County had a population of 929,030 in 2010 and 936,961 in 2017 (0.85% increase). The population is 52.5% female and 47.5% male, 54.2% black and 41.1% white. The opioid prescription rate for Shelby County is above the national average, but lower than that for Tennessee. According to the CDC, the opioid prescription rate per 100 persons in Tennessee has been declining steadily since its peak at 140 in 2010, but remains much higher than the national average.

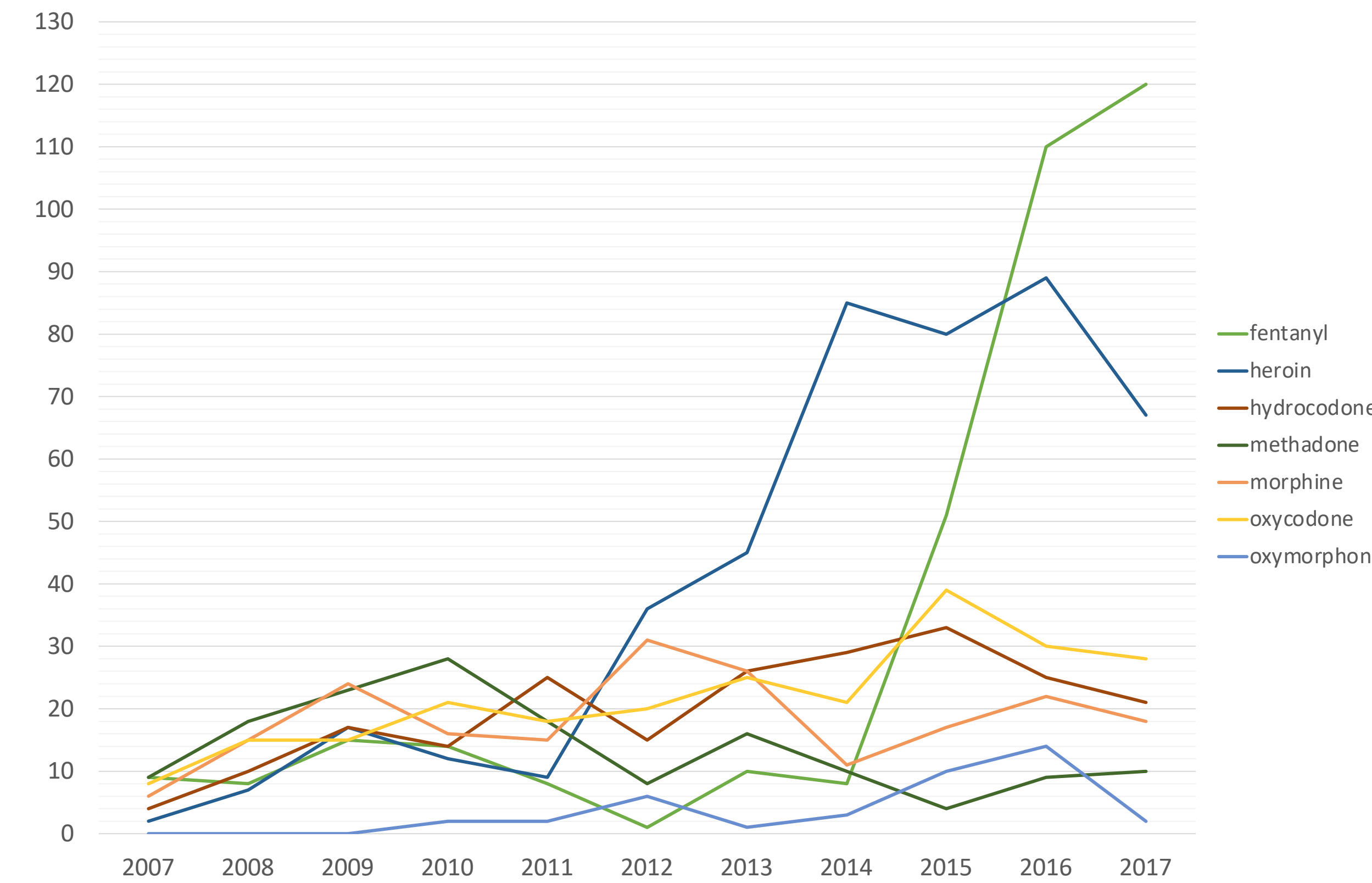


METHODS

The WTRFC Death Investigation and Decedent Information (DIDI) database was searched for all deaths that listed opioid toxicity in the cause of death during the 10-year period from 2007 to 2017. Data gathered included age, sex, race, day, month, and year of the incident, location of death, manner of death, and cause of death. Deidentified zip code data was sent to a third party for creation of the geographical heat maps using ESRI ArcMap Geographic Information System software.

RESULTS

Most Common Opioids in Opioid-Related Deaths (2007-2017)



Drugs Most Commonly Combined with Opioids in Opioid-Related Deaths (2007-2017)

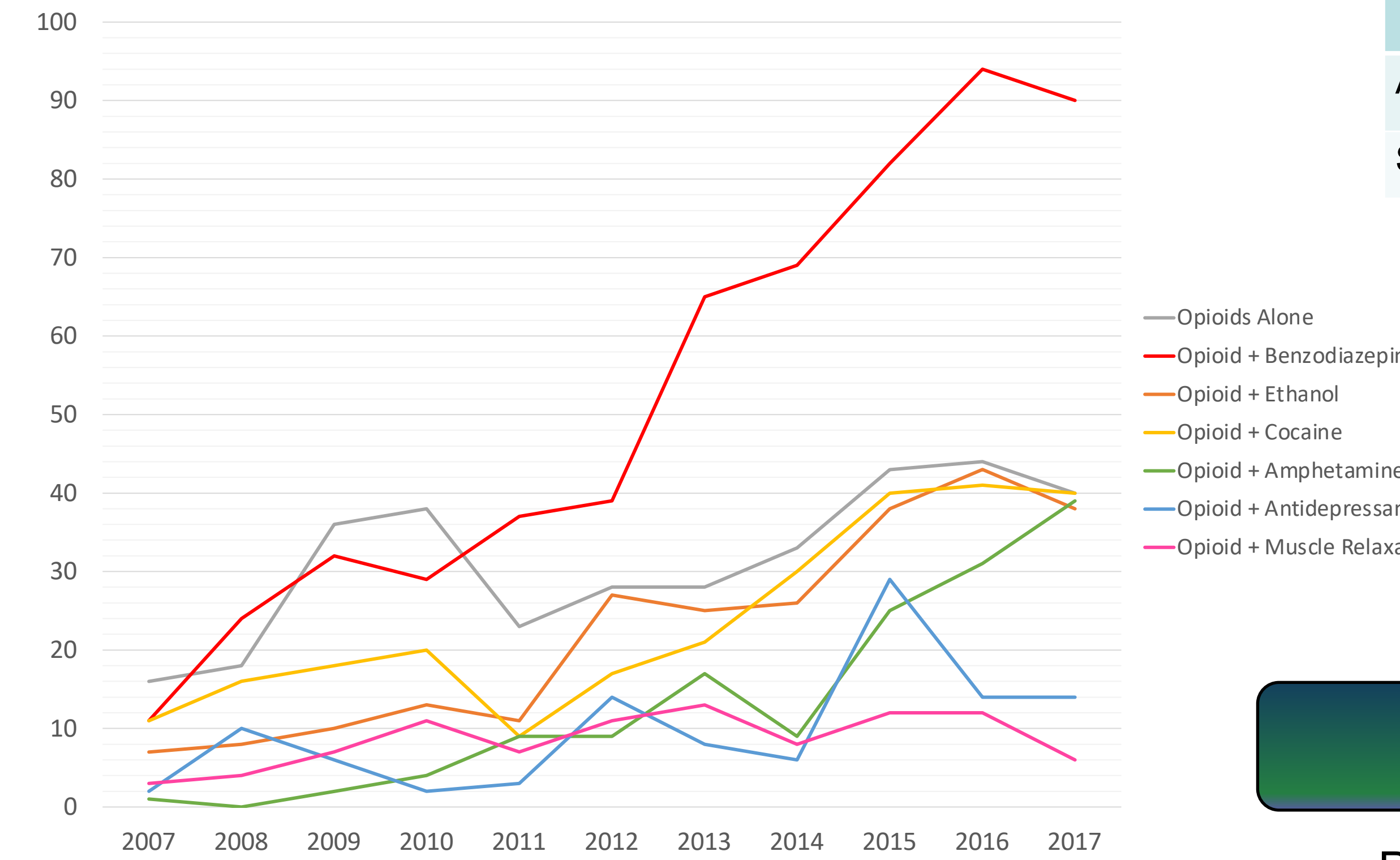


Table 1. Occurrences of Opioid-Related Deaths from 2007-2017

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Accident	36	62	86	85	68	103	124	135	176	200	196
Suicide	6	6	12	12	8	7	6	3	8	3	2

Table 2. Average Number of Drugs Involved in Opioid-Related Deaths

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
All Drugs	2.21	2.41	2.26	2.05	2.67	2.63	2.86	2.67	3.07	3.21	3.08
Opioids	1.14	1.31	1.24	1.18	1.45	1.27	1.32	1.34	1.43	1.7	1.65
Non-opioids	1.07	1.1	1.01	0.88	1.22	1.35	1.54	1.33	1.64	1.51	1.42

CONCLUSIONS

Prescription opioids such as methadone and oxycodone were most common in the earlier half of the study period, but were quickly overshadowed by the rise in heroin beginning in 2012. The number of overdose cases involving fentanyl rose precipitously beginning in 2015, spiking from 8 cases in 2014 to 51 in 2015, and peaking at 120 cases in 2017 with a predicted upward trajectory. Fentanyl analogues such as acetyl, furanyl, and despropionyl fentanyl began to appear as a cause of death in 2015 and 2016. Benzodiazepines were the most common class of drugs to be combined with opioids (involved in 46.3% of opioid-related deaths in 2016), followed by cocaine, ethanol, and amphetamines.

Out of 1,344 cases of opioid-related deaths in 2007-2017, a total of 838 were male (62.4%) and 506 were female (37.6%). 1108 were white (82.4%) and 231 were black (17.2%). The most prevalent group across all 10 years was white men, which comprised 50.8% of cases. Potential race misclassification within WTRFC's database may contribute to underestimates for certain categories. It is noteworthy that although Shelby County has a majority black population, white was the most prevalent racial group in opioid-related deaths. As the study period progresses, there is a trend of an increasing proportion of younger people dying of opioid overdose. In 2007-2010, the most prevalent age group involved in opioid-related deaths was age 45-54. In the second half of the decade, people aged 25-34 were the most prevalent group. The majority of deaths occurred in the 38134, 38122, and 38111 zip codes, each with 61-70 deaths cumulatively in 2007-2017.

In recent years, illicitly manufactured opioids have become the new face of the opioid epidemic as opioid prescription rates have steadily declined across the country. Understanding the changing trends of opioid abuse is critical in order to predict the trajectory of the epidemic moving forward.

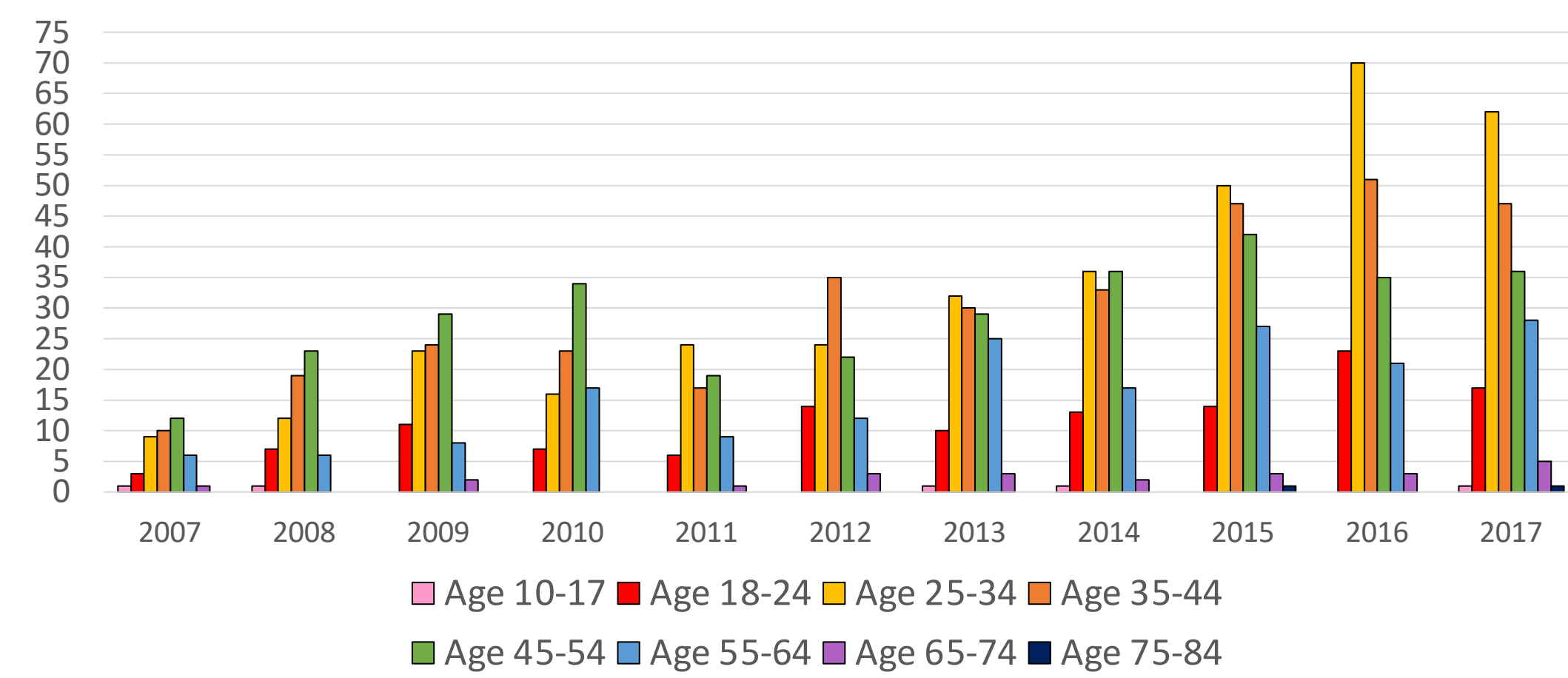
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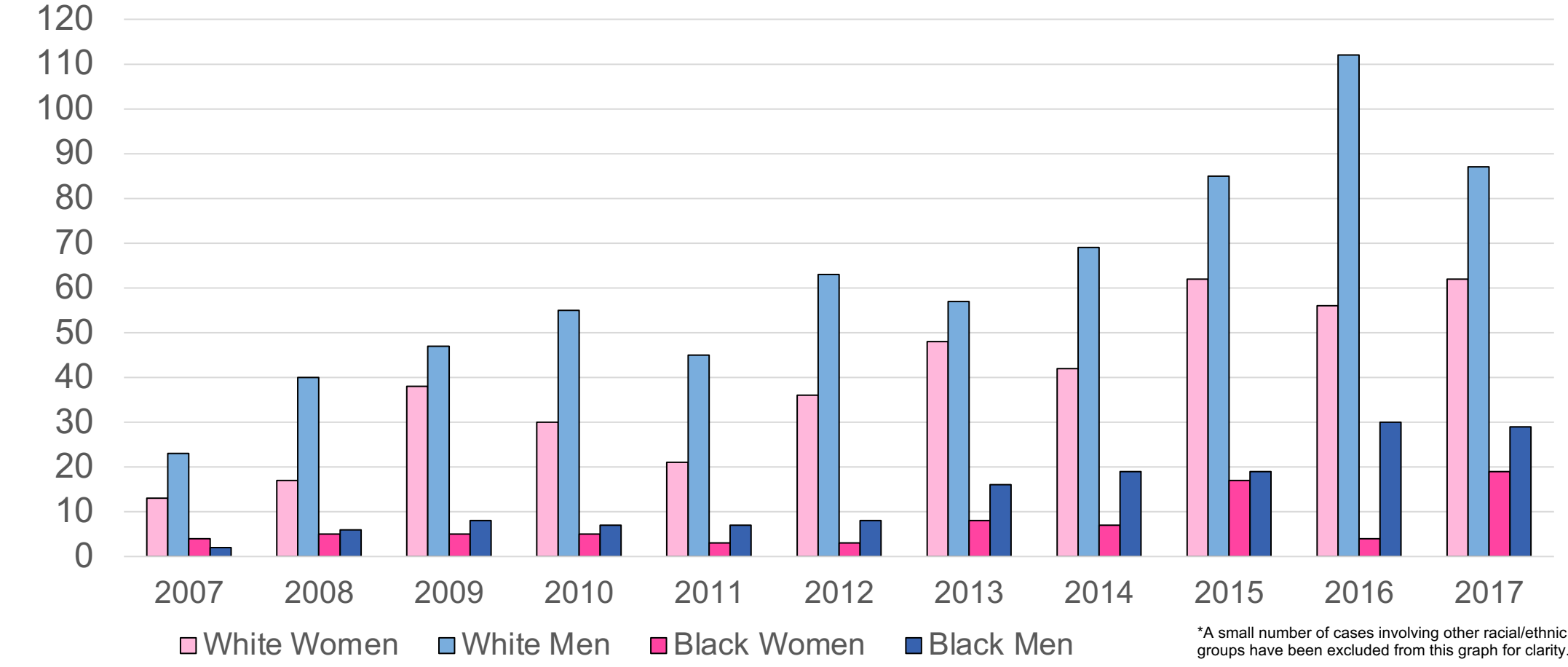
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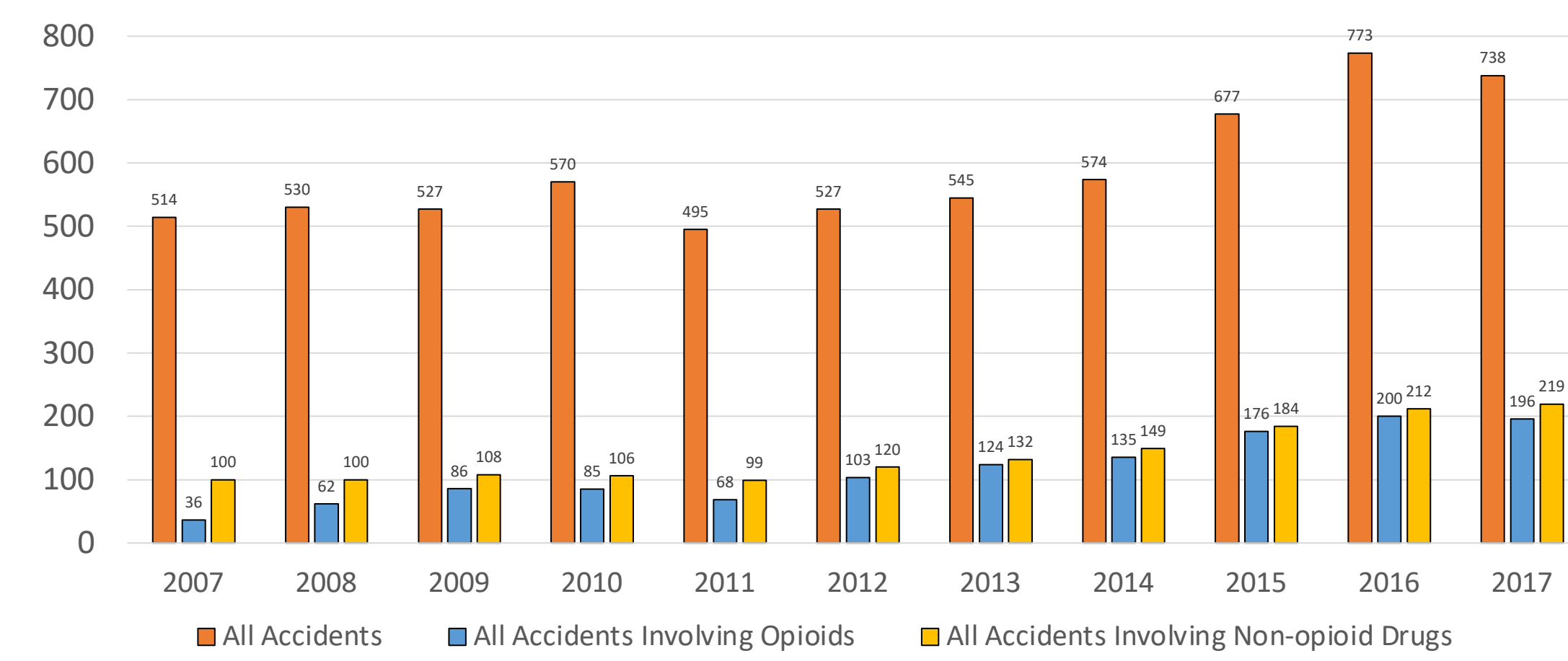
Opioid-Related Deaths by Age Group (2007-2017)



Opioid-Related Deaths by Race and Gender (2007-2017)



All Accidental Deaths (2007-2017)



Drug Combinations in Opioid-Related Deaths (2007-2017)

