



Suicide Peak and the Opioid Crisis in Cuyahoga County, Ohio



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Background

- Suicide was the tenth leading cause of death in the United States in 2017 and the second leading cause of death for Americans age 10-35, accounting for over 47,000 deaths in the United States¹.
- The rate of suicide in Ohio has increased by more than 30% from 1999-2016².
- The number of suicide deaths in Cuyahoga County, Ohio peaked dramatically in 2018 at 207 suicides from 176 in 2017.
- Substance abuse is a major risk factor for suicide³, particularly opioid use disorder⁴.
- Unintentional drug overdose is the leading cause of injury-related death in Ohio with one of the highest overdose death rates in the United States⁵.
- **Objective:** Characterize the 2018 suicide population and compare to unintentional injury-related deaths with and without opioid abuse (fentanyl overdose deaths and motor vehicle accidents, MVAs).
- **Hypothesis:** The recent peak in suicides in Cuyahoga County may be a reflection of the opioid crisis.

Materials and Methods

- Cuyahoga County Medical Examiner's Case Files and OARRS reports were reviewed to record variables of interest for 2018 suicide deaths, fentanyl overdoses, and MVAs.
- **Medical Examiner's Files-** Decedent record review, autopsy report, toxicology report, scene investigation report, EMS incident report, and medical records
- **OARRS-** Ohio's prescription drug monitoring program; indicates access to controlled substances and documents alerts and overdose risk
- The three study populations were reviewed to exclude individuals <15 years old and out of county deaths or deaths in which the injury occurred out of county; MVAs with a history of opioid abuse or positive opioid toxicology were excluded.
- **Comparative Analysis-** Categorical variables for fentanyl overdose and MVA populations were compared to the suicide population using chi square analysis (T-test for numerical data). Multivariate analysis was used to analyze relationships and variability between groups and among categorical variables.

Results

- Suicide and fentanyl overdose decedents are more similar to each other racially than suicides and MVAs.
- The proportion of the suicide population having an OARRS file trends between the fentanyl overdose and MVA populations. Suicides have no statistically significant difference to MVAs for narcotics rx (p value=0.66) and no significant difference to fentanyl overdoses for benzo rx (p value=0.58).
- Of those with substance use, 14.3% of the suicide decedents' files contain evidence of opioid abuse.
- Doctor shopping is low in all 3 groups, suggesting that OARRS and other preventative measures may be working effectively.
- Overdose Risk Score calculated by OARRS has no statistically significant difference between suicide and fentanyl overdose populations (p value=0.50) when comparing means. Suicide and MVA groups are significantly different (p value=0.01).
- The fentanyl overdose population is characterized by depression/bipolar disorder at an intermediate level between the other groups, with a similar proportion of the fentanyl overdose population and suicide population having other mental health illnesses.

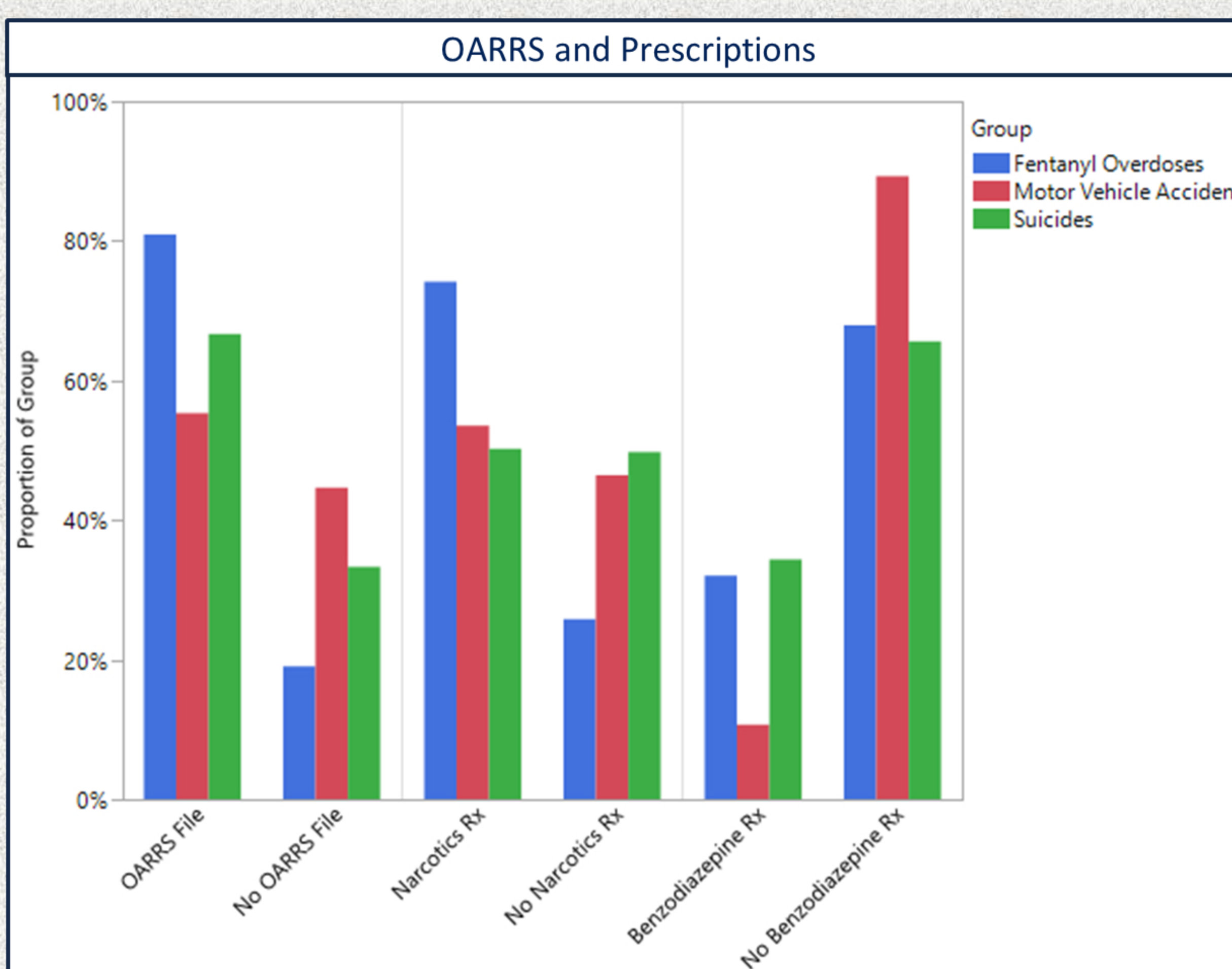


Figure 1. OARRS File and Prescriptions. Presence of an OARRS File and OARRS records of narcotic and benzodiazepine prescriptions are compared between the three groups.

Group	Race			
	Asian Indian	Native American	Black	White
Fentanyl Overdoses	0.3%	0.3%	19%	80%
Motor Vehicle Accidents	0%	2%	66%	32%
Suicides	0%	0%	16%	84%

Group	Ethnicity		Gender	
	Hispanic	Not Hispanic	Female	Male
Fentanyl Overdoses	6%	94%	28%	72%
Motor Vehicle Accidents	2%	98%	29%	71%
Suicides	3%	97%	22%	78%

Group	Age			
	15-29	30-44	45-59	60+
Fentanyl Overdoses	18%	42%	27%	13%
Motor Vehicle Accidents	23%	21%	27%	29%
Suicides	21%	25%	22%	32%

Group	Veteran Status		Education	
	Veteran	Not Veteran	Unknown	
Fentanyl Overdoses	4%	96%	2%	
Motor Vehicle Accidents	13%	88%	2%	
Suicides	9%	91%	2%	

Group	Education (cont.)			
	8th grade or less	9th-12th grade; no diploma	High school/GED	Associate degree
Fentanyl Overdoses	2%	22%	55%	3%
Motor Vehicle Accidents	2%	18%	54%	11%
Suicides	1%	7%	51%	6%

Group	Education (cont.)			
	College, but no degree	Bachelors degree	Masters degree	Doctorate/professional degree
Fentanyl Overdoses	12%	3%	1%	0.5%
Motor Vehicle Accidents	7%	5%	2%	0%
Suicides	14%	12%	4%	3%

Group	OARRS File		Narcotics Rx	
	OARRS File	No OARRS File	Yes	No
Fentanyl Overdoses	81%	19%	74%	26%
Motor Vehicle Accidents	55%	45%	54%	46%
Suicides	67%	33%	50%	50%

Group	Benzodiazepine Rx		Doctor Shopping	
	Yes	No	Yes	No
Fentanyl Overdoses	32%	68%	6%	94%
Motor Vehicle Accidents	11%	89%	2%	98%
Suicides	34%	66%	3%	97%

Group	Pharmacy Shopping		Depression/Bipolar	
	Yes	No	Yes	No
Fentanyl Overdoses	16%	84%	32%	68%
Motor Vehicle Accidents	0%	100%	7%	93%
Suicides	2%	98%	68%	32%

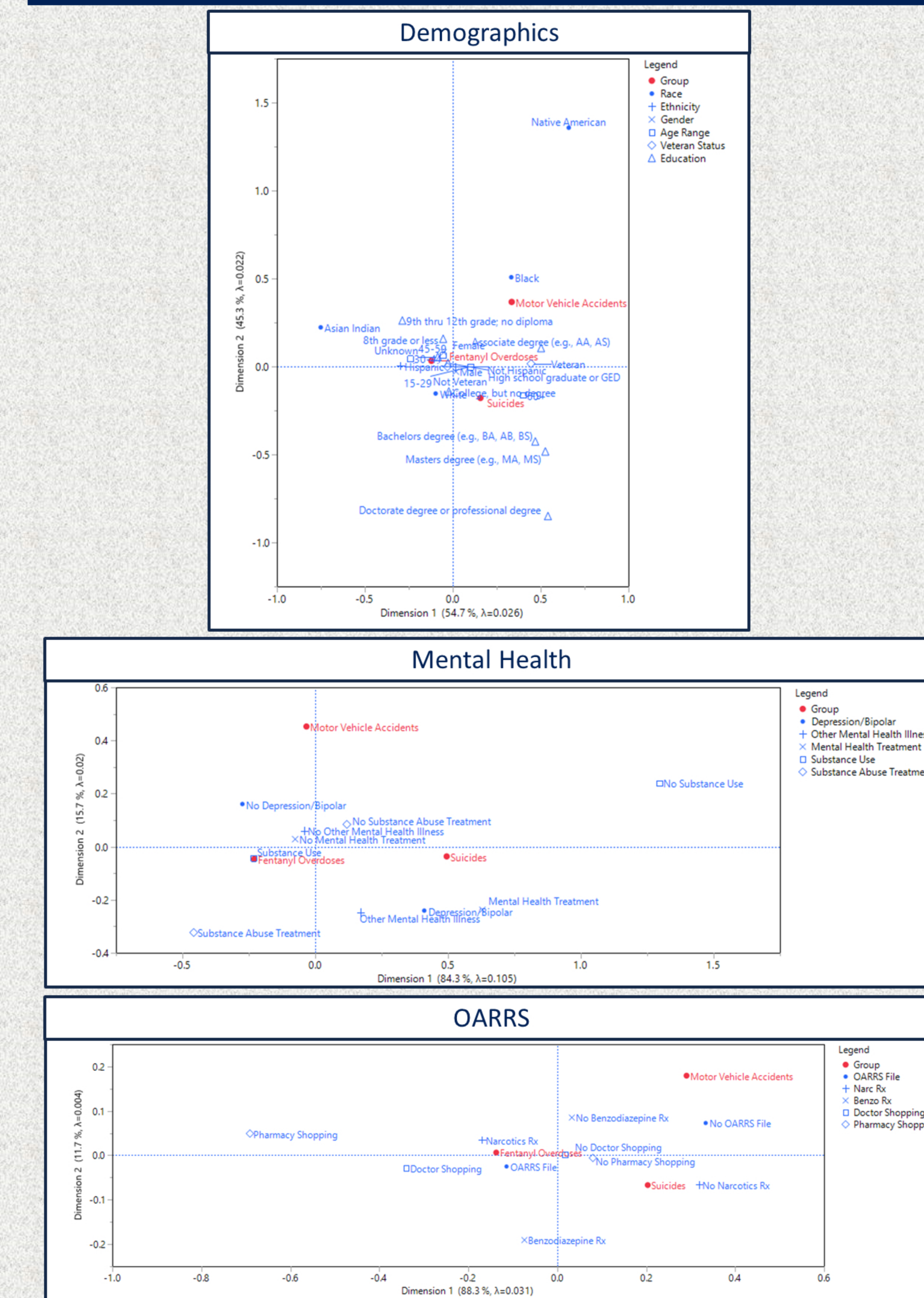
Group	Other Mental Health Illness		Mental Health Treatment	
	Yes	No	Yes	No
Fentanyl Overdoses	19%	81%	7%	93%
Motor Vehicle Accidents	4%	96%	2%	98%
Suicides	26%	74%	22%	78%

Group	Substance Use		Substance Abuse Treatment	
	Yes	No	Yes	No
Fentanyl Overdoses	100%	0%	30%	70%
Motor Vehicle Accidents	75%	25%	0%	100%
Suicides	56%	44%	8%	92%

Group	Mean Overdose Risk Score
Fentanyl Overdoses	150
Motor Vehicle Accidents	66
Suicides	140

Figure 2. Total Proportions and Comparative Analysis. Total proportions for each group are shown by variable. Proportions are bolded for variables with no statistically significant difference (p value>0.05) relative to the suicide group by chi square analysis (T-test analysis for ORS score). Yellow highlighting calls attention to trends of interest. The study population consists of 189 suicide decedents, 399 fentanyl overdoses, and 56 MVAs.

Multivariate Analysis



Conclusions and Discussion

- The increase in suicides may be a previously unidentified consequence of the opioid epidemic, supported by demographic, prescribing, and mental health data.
- Opioid/benzodiazepine co-prescription is associated with increased suicide risk⁶, calling attention to observed OARRS patterns.
- Future directions involve Alcohol, Drug Addiction & Mental Health Services record review to further analyze mental health and addiction history and treatment.

References:
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