

Social Determinants of Substance Use and Drug Overdose Prevention



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Introduction

- Drug overdose has become the leading cause of accidental death in the United States (US).¹
- Opioids have claimed nearly 500,000 lives in the last twenty years.²
- Preventive interventions have primarily focused on curbing opioid prescribing and targeted individuals' treatment strategies.³
- Little is known about the social and environmental context surrounding these individuals.

Study Aim

- To address the gap in the literature and examine the association between drug overdose mortality and critical social determinants of health (SDOH).

Study Design

- Ecological study focusing on county-level data on drug overdose deaths and the main domains of SDOHs (demographics, opioid prescription rate, quality of life, economy, education, housing, and access to healthcare. (Table 1)
- Data were obtained from PolicyMap and County Health Rankings & Roadmaps websites.^{4,5}
- Data were collected for Mid-Atlantic states: West Virginia, Delaware, Maryland, Pennsylvania, Washington D.C., and Virginia because of these states high rankings for drug overdose death rates in 2019, and to control for regional effects.
- Descriptive statistics were used to describe the characteristics of the study data.
- Associations between each characteristic and drug overdose mortality was measured through bivariate analysis using a negative binomial regression.
- Multivariate analysis using negative binomial regression was performed to detect drug overdose death risk factors.
- All statistical analysis were performed with SAS version 9.4 (SAS Institute, Cary, NC).

Principal Findings

- Among 283 counties included in this study, the observed median county-level drug overdose death rate was 28 deaths per 100,000 people.
- Findings of bivariate analyses demonstrated a statistically significant positive association between drug overdose death and violent crime (P <.0001), access to the internet (P <.0001), per capita income (P <.0001), average household size (P 0.0073), and having a primary care physician (P <.0001).
- Education (P <.0001), and vacancy rate (P <.0001) had a statistically significant negative association with drug overdose death.
- While opioid prescription rate was borderline statistically significant (P 0.0767) in bivariate analysis, it was no longer statistically significant (P 0.4123, 95% CI: -0.33, 0.14) after controlling for demographics and SDOHs in a multivariate-adjusted model (Table 1).
- Education (P 0.2424, 95% CI: -3.1, 13.5) and household size (P 0.1456, 95%CI: -70.5, 19.7) lost their association with drug overdose death, in the adjusted model. (Table 1).
- Social Vulnerability Index, which was not strongly associated with drug overdose death (P 0.1160) in the bivariate analysis, was statistically significant in the multivariate-adjusted analysis (P 0.0007) (Table 1).

Table 1. Association between characteristics and drug overdose death rate

Outcome	Variable	Estimate (SE)	Percent change (95%CI)	p-value
Drug overdose death rate	Demographics			
	African American percentage	0.01 (0.006)	1.0(0.03, 2.21)	0.0434*
	Men percentage	0.03 (0.03)	3.05(-1.7, 8.5)	0.2037
	Age≥65 percentage	-0.04 (0.02)	-3.92(-6.9, -0.33)	0.0315*
	Median age percentage	-0.02 (0.02)	-1.98(-5.8, 2.3)	0.3879
	Education			
	Education percentage	0.04 (0.04)	5.1(-3.1, 13.5)	0.2424
	Health			
	Opioid prescription rate	-0.001 (0.001)	-0.1(-0.33, 0.14)	0.4123
	Have PCP	0.18 (0.02)	19.7(15.9, 24.5)	<.0001*
	Quality of life			
	Violent crimes	0.001 (0.0003)	0.1(0.07, 0.20)	<.0001*
	SVI	1.47 (0.43)	334.9(86.1, 907.3)	0.0007*
	Internet percentage	0.07 (0.015)	7.3(3.7, 9.9)	<.0001*
	Economy/income			
	Poverty percentage	0.02 (0.019)	2.0(-2.1, 5.3)	0.4193
	Income dollar	0.0 (0.0)	0.0(0.0, 0.01)	0.0003*
	Housing			
	Average household size	-0.51 (0.36)	-40.0(-70.5, 19.7)	0.1456
	Vacancy rate	-0.03 (0.007)	-2.96(-4.2, -1.4)	<.0001*

Conclusions

- Factors that affect quality of life, such as violent crime, social vulnerability, and access to the internet, are significantly associated with opioid fatal overdose, possibly more so than opioid prescribing.
- Future studies should be expanded to the entire mid-Atlantic region and examine the impact of access to pharmacies and physicians on opioid overdose death.

Policy/Practice Implications

- The results of this study suggest that in addition to monitoring or optimizing opioid prescribing, healthcare systems, community leaders, and policymakers should focus on the populations with high rates of violent crimes and social vulnerability index, in order to address the opioid epidemic through a comprehensive treatment plan that is holistic in nature.

References

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