Urban vs. Rural Disparities in Medical Outcomes of Controlled Substance Exposures: Findings from the Poison Control Center Data 2019 – 2022

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INTRODUCTION

This study seeks to describe and compare patterns of medical outcomes associated with exposures to controlled substances (methamphetamine, opioids, cocaine, benzodiazepine, and other narcotics) between urban and rural communities in US. The following hypothesis was tested: Compared to urban communities, rural communities in US experienced higher rates of calls to Poison Control Centers (PCC) due to exposures to controlled substances and higher rates of cases that resulted in major adverse medical effects including death.

METHOD

A retrospective observational data analysis using secondary data extracted from National Poison Data System of American Association of Poison Control Centers between 10/01/2019 and 09/30/2022. Counts of calls per county per quarter were calculated and then divided by the corresponding estimated county population sizes as of 2019 to obtain per-100,000-per-quarter rates of calls made to Poison Control Centers. A difference-in-difference method implemented via a set of random effects negative binomial regression models was used to assess the degrees of rural-urban disparities.

All cases of exposures to the controlled substances as listed above that were reported to all Poison Control Centers in the US during the study period. The fully de-identified dataset obtained by the research team included patient demographics (e.g., age, gender, and geographical location) along with extensive descriptions of the case details – e.g., types of substances involved, exposure site (e.g., patient home, healthcare facility, etc.), reasons for exposure (e.g., intentional or unintentional), treatments rendered, and clinical outcomes.

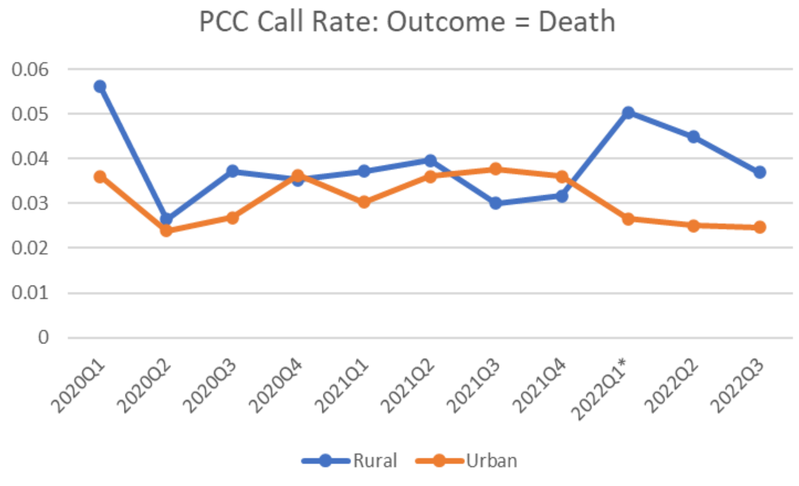
METHOD (continued)

"Death" is defined as patient mortality due to exposure or to direct complication of the exposure where the complication was unlikely to have occurred had the toxic exposure not preceded the complication. Only include those deaths which are probably or undoubtedly related to the exposure. Also include deaths in which the exposure was a contributing factor.

"Major Effect" is defined as cases in which the patient has exhibited symptoms due to exposure which were life-threatening or resulted in significant residual disability or disfigurement. Symptomatic patients are followed until symptoms have resolved or nearly resolved, unless the symptoms are anticipated to be long-term or permanent.

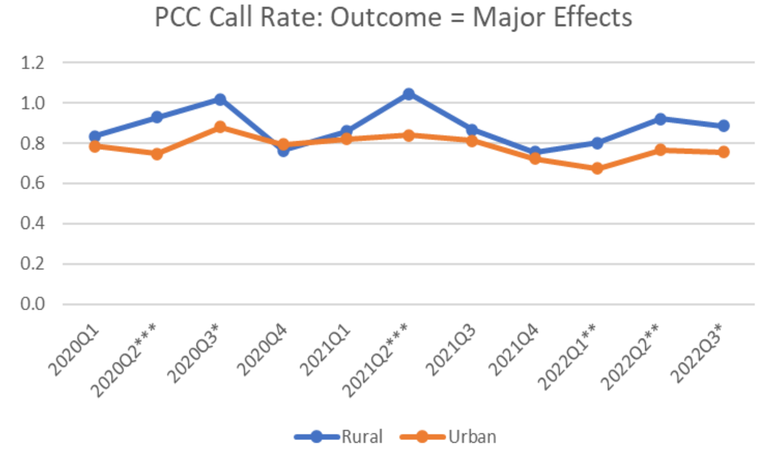
Examples: repeated seizures or status, ventricular tachycardia with hypotension, cardiovascular instability, coma with hypotension, cardiac arrest or respiratory arrest, esophageal stricture, etc.

RESULTS



* p<0.1; **<0.05; ***<0.01

All rates are calculated as "call counts per 100k county population" (as of 2019)



CONCLUSION

The urban-rural disparity in exposures to controlled substances and the associated adverse medical outcomes persisted during and after the COVID19 pandemic. The results suggest that the rural communities were subject to not only higher prevalence of substance use disorders but also to higher rates of severe medical outcomes requiring greater intensity of treatment and follow-up care than urban communities. These findings highlight the continuing challenges faced by rural communities in addressing the epidemic of substance use disorders and the substantial burdens of treatment and care associated with it.

DISCLOSURE

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