Opioid Overdose Mortality Trends in Wisconsin, 2004-2019

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ABSTRACT

Background: Opioid-related mortality in Wisconsin by race differs from national trends: Black Wisconsinites are nearly twice as likely as Whites to die by opioid overdose. These trends warrant further study by other demographic factors on the state level.

Methods: We characterize trends in mortality due to opioid overdose in Wisconsin using CDC WONDER data for 2004-2019 by race, age, and sex. ICD-10 (International Classification of Disease, Tenth Revision) codes were selected per national guidelines for identifying opioid-related overdose deaths.

Results: Opioid overdose mortality increased 415% during the study period. Black or African American and American Indian or Alaska Native populations had consistently higher risk than White populations, with an older age distribution.

Conclusion: We identify inequities in opioid overdose mortality that have persisted over time in Wisconsin. Different age distributions by race may indicate different pathways to overdose and require further investigation to guide upstream mitigation strategies.

INTRODUCTION

Opioid-related mortality represents a global public health crisis.[1] The domestic response to this crisis has included a wide array of public health interventions, particularly those aimed at preventing overdose deaths. Understanding trends in mortality due to opioid overdose is key in guiding these efforts.

Drug overdose deaths have been rising across the United States.[2] In Wisconsin, the mortality rate due to opioid overdose is greater than that of the nation as a whole, and the mortality rate due to synthetic opioids — to which much of the recent growth in opioid-related deaths is attributed —increased nearly 11-fold from 2004 through 2019.[3,4] A detailed look at these trends over time in Wisconsin is warranted.

Wisconsin has persistent racial health disparities, with counties with larger Black and American Indian/Alaska Native (AI/AN) populations performing worse on a wide range of health measures than all other Wisconsin counties.[5] Wisconsin's Premature Death Inequality Ratio is 2.1, the 10th worst in the nation.[6] (This indicator was created by the American Public Health Administration and is defined as "ratio of the racial/ethnic group with the highest premature death rate before age 75 to the white population.") Opioid-related mortality is no exception: Black Wisconsinites are nearly twice as likely to die by opioid overdose when compared to White Wisconsinites.[7] This diverges from national data, where White Americans have a higher mortality rate due to opioid overdose than Black Americans.[2,8] The narrative of an opioid epidemic affecting White Americans and mobilization of treatment efforts contrasts with the historic criminalization of Black and Latinx drug users and highlights the differentials of privilege and power that exist in the US.[9] Despite this narrative, recent national trends have shown the highest increase in mortality to be among Black Americans.[10]

In this brief report, we aim to characterize the trends in mortality due to opioid overdose in Wisconsin, compare rates between groups by age and race, and compare these rates to other US states.

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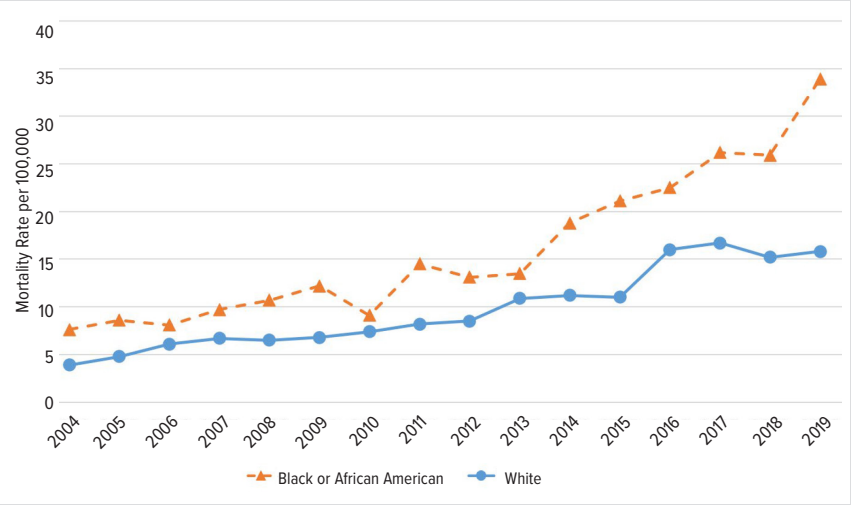
METHODS

This was a descriptive study analyzing trends in opioid-related overdose mortality in Wisconsin compared to other US states. Data for this analysis was obtained from CDC WONDER for 2004-2019.[11] All ages, sexes, and races were included. Mortality related to opioid overdose was identified using ICD-10 (International Classification of Disease, Tenth Revision) codes based on the Substance Abuse and Mental Health Services Administration's (SAMHSA) Center for the Application of Prevention Technologies "Using International Classification of Diseases Codes to Assess Opioid-Related Overdose Deaths."[12]

Deaths were included in this study if they had both an underlying cause of mortality of accidental poisoning (X40-44), intentional self-poisoning (X60-64), assault (X85), or poisoning of undetermined intent (Y10-14), as well as an opioid-related contributing cause of overdose death (T40.0-40.4, T40.6). The exposures analyzed were age, race, sex, place (Wisconsin vs other US states), and year.

Descriptive statistics were calculated by CDC WONDER or in Microsoft Excel. Age-adjusted or age-specific mortality rates were calculated for each age, race, and sex subgroup, and bivariate analyses also were conducted. Subgroup analyses and age-adjustment were done in order to address potential confounding.

Figure 1. Opioid-Related Overdose Mortality Rates per 100,000 in Wisconsin by Race, 2004-2019



Yearly data for the American Indian Alaska Native population is not shown (unreliable due to small sample size). Data from CDC WONDER.[11]

RESULTS

Wisconsin Data

The age-adjusted mortality rate due to opioid overdose in Wisconsin has increased in recent years, from 4.0 per 100,000 in 2004 to 16.6 per 100,000 in 2019—an increase of 415%. The same trend was demonstrated for all age groups and races in the state, mirroring an overall increase in opioid overdose mortality in the US during 2004-2019.[11]

Black or African American and AI/AN Wisconsinites have had a consistently higher mortality rate due to opioid overdose during this timeframe. Both Black and White populations in Wisconsin have experienced a sharp increase in mortality rate in recent years, with a plateau or slight decrease from 2017 to 2018 (Figure 1). Data for AI/AN Wisconsinites by year were unreliable due to small sample size and are not shown.

The highest mortality rate in Wisconsin due to these causes was seen among AI/AN, followed by Black Wisconsinites. Mortality rates by sex, race, and age are described in the Table. Distribution of mortality rates among age groups differed by race. Among Black Wisconsinites, older age groups had higher mortality rates, whereas for White Wisconsinites, younger age groups had higher mortality rates (Figure 2). Among Black Wisconsinites, the highest mortality rate was among those ages 45-54, whereas among White Wisconsinites, the highest mortality rate was among those ages 25-34. With the exception of the 25-34 age group, the mortality rate for Black Wisconsinites exceeded that of White Wisconsinites for all age groups during the study period (Figure 2).

Table. Opioid Overdose Deaths, Mortality Rate per 100,000 per Year, and Relative Risk of Mortality in Wisconsin, 2004-2019

	# Deaths	Mortality Rate per 100,000 per year (95% CI)	Relative Risk (95% CI)
Sex			
Women	3077	6.9 (6.6-7.1)	Ref
Men	5673	12.7 (12.4-13)	1.8 (1.8-1.9)
Race			
White	7636	9.7 (9.4-9.9)	Ref
Black/African American	907	16.6 (15.5-17.7)	1.7 (1.6-1.8)
American Indian/Alaska Native	181	17.7 (15.1-20.3)	1.8 (1.6-2.1)
Asian/Pacific Islander	26	1.0 (0.7-1.6)	0.1 (0.07-0.16)
Age group			
15-24 years	876	6.9 (6.5-7.4)	7.2 (5.7-9.3)
25-34 years	2258	19.7 (18.9-20.5)	20.5 (15.8-27)
35-44 years	2067	17.6 (16.8-18.4)	18.3 (14.2-24)
45-54 years	2046	15.6 (14.9-16.2)	16.2 (12.5-21.2)
55-64 years	1176	10.3 (9.7-10.8)	10.7 (8.3-13.9)
65-74 years	234	3.3 (2.8-3.7)	3.4 (2.8-4.0)
75-84 years	41	0.96 (0.7-1.3)	Ref

Abbreviation: Ref, reference.
Data are from CDC Wonder.[11] Sex and race mortality rates are age-adjusted.

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Comparison to Other US states

The relative risk (RR) of mortality for Black Americans compared to White Americans by state during the years 2004-2019 is shown in Figure 3. Wisconsin and other upper Midwest states (shown in orange) differ from the remainder of the country in that the relative risk of mortality for the Black population exceeds that of the White population. The relative risk of mortality was lowest for Black residents compared to White residents in Mississippi (RR 0.15). In contrast, the relative risk for Black residents compared to White residents was highest in Minnesota (RR 2.2). In Wisconsin, the relative risk of death due to opioid overdose is 1.7 times higher for Black residents than for White residents.

DISCUSSION

Relevance

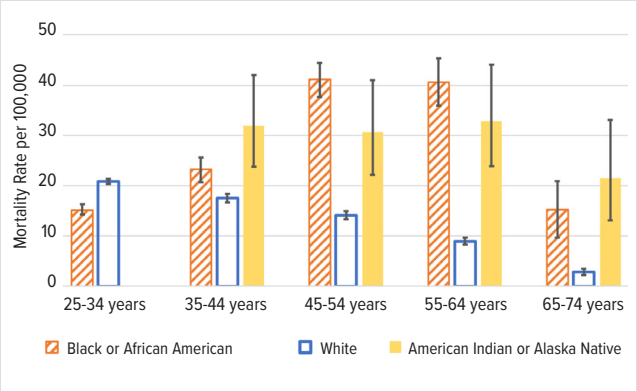
Overall, mortality due to opioid overdose increased in Wisconsin from 2004 through 2019, with the sharpest increase in the years following 2014. This rise parallels a national trend in opioid-related mortality and has been attributed to the increase in prescription opioid use and increased availability of synthetic opioids.[2]

Mortality by opioid overdose affects different age groups, racial groups, and sexes at different rates. Our findings are consistent with previous analyses of poisoning mortality rates in the US during 1999-2006.[13] In particular, the opioid overdose mortality rates are consistently higher for Black and AI/AN Wisconsinites than White Wisconsinites.

This analysis also reveals a different distribution of age-specific mortality rates between Wisconsinites of different races. During the study period, the mortality rate for White Wisconsinites was highest among younger age groups, whereas for Black Wisconsinites the mortality rate due to opioid overdose peaks in the 45-54 age group (Figure 2). This is consistent with recent work by Hoopsick et al,[8] in which national opioid overdose mortality rates among middle-aged adults were analyzed by type of opioid involved and by race. This study demonstrated the highest increase in opioid overdose mortality among middle-aged Black Americans, with a different distribution of opioid type, indicating possible alternative "trajectories" of opioid use among different racial groups.

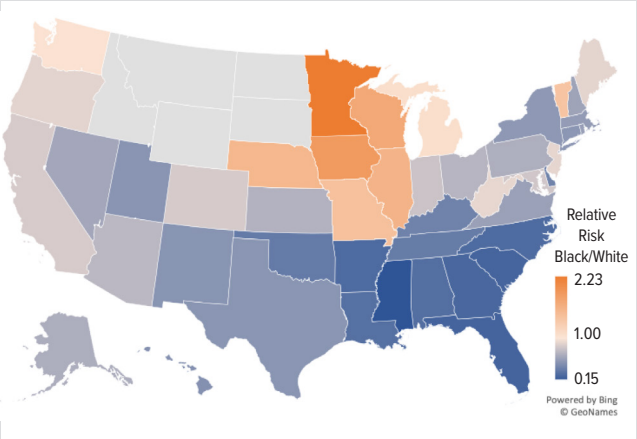
Overall, these data are indicative of systemic inequities faced by minority racial groups in Wisconsin and underscore the need to evaluate the experiences of these populations in the state. For example, the disproportionate criminalization of drug use for communities of color[14] may contribute to lower rates of treatment in these populations and higher rates of overdose postincarceration.[15] These data urge further investigation regarding overdose deaths and patterns of opioid use in Wisconsin. The authors further echo the call by James and Jordan[16] for culturally appropriate outreach and of Hoopsick et al[8] for widespread criminal justice reform.

Figure 2. Mortality Rate per 100,000 by Age Group and Race in Wisconsin, 2004-2019



Data are for all years of the time period combined. Data for the American Indian/Alaska Native 25-34 year age group is not shown (unreliable due to small sample size). Data from CDC WONDER.[11]

Figure 3. Relative Risk (RR) of Mortality by Opioids or Other Drugs by Race for Black/African American Populations vs White Populations, 2004-2019



Orange states had a higher RR for Black residents vs White residents, whereas blue states had a lower RR among Black residents vs White residents. States with unreliable or suppressed mortality data by race are shown in light gray. Data from CDC WONDER.[11]

Limitations

This study is not without limitations. Mortality data are limited by errors in death certificates, including inaccurate reporting of cause of death and misclassification of sex, race, or ethnicity, the latter being particularly salient for AI/AN populations.[17] In addition, this analysis provides an overview of mortality related to opioids but does not include information on the type of drug related to each death. Furthermore, we conducted our analysis by race, an approach that is inherently limited, as the categories themselves are socially constructed and serve as imperfect proxies for diverse experiences of racism.[18] These data are presented with the intention of illuminating an inequity, with the acknowledgement that further work is required to evaluate and mitigate root causes.

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In addition, yearly data for age-adjusted mortality rates in Wisconsin are only available for the Black and White populations due to small sample sizes in other races. Significant inequities also exist in AI/AN populations, both nationally and within the state,[19] but disparities over the selected time period were not observed in our analysis, which may point to limitations of the available data.

Future Directions

Mortality data is key in informing policy and strategies to slow the opioid epidemic. In particular, our analysis indicates racial disparities in opioid-related deaths in Wisconsin, underscoring inequities faced by Black and AI/AN populations in the state. Further analysis should be done to identify the precise substances involved, the geographic distribution of deaths, and the underlying causes of the disparities and different age distributions within racial groups seen here. Close monitoring of mortality data is important to inform ongoing efforts to mitigate the opioid crisis.

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