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Intersectionality and Structural Drivers of Fatal Overdose Disparities in the United States: a Narrative Review

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Abstract

Purpose of Review Disaggregated data has increasingly confirmed the persistence of racial and ethnic disparities in fatal drug-related overdose in the United States. Less is known about additional disparities or how they interact to exacerbate mortality. Utilizing an intersectional framework, we reviewed literature on fatal overdose disparities and potential structural drivers.

Recent Findings Most published studies document overdose disparities by race and ethnicity; research examining other identity-based and sociodemographic disparities (e.g., gender, sexuality, lifecourse stage, disability) is emerging but more limited. Some studies point to potential structural drivers of disparities (e.g., housing, law enforcement interactions, employment, prevention and treatment service access), yet major data limitations inhibit complex research. Nevertheless, intervention and implementation strategies to reduce overdose exist.

Summary An intersectional framework helps explore how marginalization and unequal access to financial resources, power, legal rights, and services drive fatal overdose disparities while illuminating promising strategies that warrant additional, rapid research.

Keywords Opiate Overdose · Drug Overdose · Disparities · Ethnicity · Gender · Intersectional Framework

Introduction

Rates of fatal drug-related overdose have increased dramatically across the United States in recent years, with a 30% rise in deaths from 2019 to 2020 and an estimated total of 107,622 deaths in 2021 [1]. The social profile of the U.S. overdose crisis has also changed over time, driven in part by drug market evolution including increasing fentanyl contamination of local supplies of heroin and other drugs (e.g., methamphetamine) and polysubstance use [2]. A critical trend highlighted in recent reviews is the emergence and persistence of clear racial and ethnic disparities within the U.S. overdose crisis, with disproportionate impacts on Black and American Indian or Alaska Native populations compared to White populations [3••, 4, 5]. However, less is known about additional types of disparities that may intersect with and further compound those observed by race and ethnicity. We thus reviewed health and social science literature to identify evidence on additional forms of fatal overdose disparities (e.g., by gender, sexuality, and age in addition to race/ethnicity) and their potential structural drivers.

To guide our review, we drew from an intersectional framework that highlights the ways in which multiple oppressions manifest throughout the lifecourse [6, 7]. An intersectional approach to understanding overdose disparities may focus on race and ethnicity while also examining other aspects of identity and experience that intersect with racial and ethnic disparities in more than merely additive ways [8]. Such an approach may also help identify various structural drivers (e.g., housing status, law enforcement interactions) of the multiple forms of oppression that result in overdose disparities [9]. As action on intersectional issues requires broad coalitions working together for change [10], to enhance the utility of this review, we also summarize key recommendations for additional research and intervention and implementation strategies that may help reduce fatal

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overdose disparities and rates overall. Principally, this review highlights the ways that overdose risks intersect, in part due to interrelated structural drivers.

Methods

For this narrative review, we summarized literature on multiple forms of fatal overdose disparities in the United States and gaps and areas for future research. We searched four databases (PubMed, Google Scholar, PLOS, Scopus) using overdose- and disparities-related search terms to identify English-language, peer-reviewed, U.S.-based studies published in approximately the last five years (2017 through early 2023) to include the most recent and relevant research on overdose disparities. Of note, although most of the studies included here used quantitative methods to assess overdose disparities (primarily drawing from national- or state-level data), we included some qualitative studies that explore potential explanatory factors and structural drivers of observed disparities (primarily using interview and ethnographic data). When available, we also included previous reviews on the subtopics discussed. Finally, we summarized key data limitations and promising intervention and implementation strategies that emerged from the included studies.

Narrative Review Findings

The first section of this review examines identity-based and socio-demographic dimensions of overdose disparities, including race, ethnicity, gender, sexuality, lifecourse changes, and disability. The second section identifies potential structural drivers of overdose disparities including housing status, law enforcement interactions, poverty, and unemployment, and prevention and treatment service access. The third section summarizes common data limitations. The final section reviews promising strategies that could help reduce overdose disparities and rates overall, including bolstering community-based prevention and treatment service access, utilizing implementation science approaches, and supporting drug law and policy reform efforts.

Identity-Based and Socio-Demographic Dimensions of Fatal Overdose Disparities

While the most frequently published fatal overdose disparities in the United States are by race and ethnicity, recent studies have also documented how race and ethnicity are not experienced in isolation from other identity-based and socio-demographic dimensions of difference. In the sections below, we summarize recent research findings regarding overdose by race and ethnicity, gender and sexuality, lifecourse stages, and disability. Of note, findings within these sections often overlap, with studies referring to multiple forms of identity and socio-demographics, which aligns with and supports the use of an intersectional framework [6, 7].

Race & Ethnicity

From 2004 to 2019, available research identified disproportionate impacts of overdose on minoritized racial and ethnic populations, including higher death rates for overdoses involving cocaine and psychostimulants among Non-Hispanic Black (henceforth referred to as Black) and American Indian or Alaska Native (AI/AN) persons, respectively [11]. Since 2019, rates of opioid and cocaine co-involved overdose plateaued among Non-Hispanic White (henceforth referred to as White) individuals but increased among Black and Hispanic individuals [12]. Overall, from 2019 to 2020, drug overdose fatality rose 44% and 39% among Black and AI/AN individuals, respectively [11]. Additionally, from 2010–2021, overdose rates increased 287.5% among Hispanic individuals compared to 160% among non-Hispanic individuals, with even more pronounced disparities in the increases in deaths due to fentanyl [13]; based on these findings, the authors recommended increased access to culturally appropriate, community engaged overdose prevention efforts for this population [13].

Recent studies have also documented the intersections of race and ethnicity with other socio-demographics. For instance, overdose mortality increased with county-level economic inequality levels, notably among Black individuals who experienced more than double the rate of fatal overdose in jurisdictions with the largest levels of income inequality [11]. Additional research assessing associations between historic "redlining" and related discriminatory lending and employment practices characteristic of structural racism and subsequent overdose outcomes, as has been done for other health conditions, is needed within overdose disparities research [14, 15]. Research on cocaine-related overdose has found elevated mortality for adults with lower educational attainment, whether Black or White, while highlighting elevated mortality among older Black men even at higher levels of educational attainment [16••]. Finally, although race and ethnicity have been frequently tied to narratives surrounding immigration [17], from 2000 to 2015, immigrant-status was not associated with overdose [18].

Gender & Sexuality

Historically, observed overdose rates across all drug categories have been higher among men than among women nationally, with the exception of specific jurisdictions (e.g., Idaho, Utah, Arkansas) where fatal overdose rates from

heroin and fentanyl were higher among women than men in 2020 [19••]. Women reportedly comprise approximately 30% of fatal overdoses in the United States [20]; however, between 1999–2017, fatal overdose rates increased 260% among women aged 30–64 years and almost 500% among women aged 55–64 years [21]. From 1999–2020, age-adjusted fatal overdose rates rose from 6.7 to 52.1 per 100,000 person among Non-Hispanic AI/AN men and 5.2 to 32.0 among Non-Hispanic AI/AN women [22]. When taking age into account, however, Bagley and colleagues found that among adolescents and young adults with a history of non-fatal opioid overdose, psychiatric comorbidities potentially complicating prevention and treatment strategies were more prevalent among girls and young women than among boys and young men [23].

Some qualitative studies have delved into contexts and potential sources of vulnerability to overdose that may differ by gender due to gendered social expectations and structural factors prioritizing caregiving roles among women, supporting the overrepresentation of women in sex work occupations, and criminalizing substance use and addiction during pregnancy [24, 25]. One qualitative study found that women who used drugs prioritized safety, health, and child-rearing above overdose concerns [26]. As Collins and colleagues have argued [27], investments in mobile harm reduction infrastructure and other support services are also needed to better serve marginalized women who have reduced service access due to prior experiences of gender-based violence and stigmatization from accessing other health and social services.

We did not identify any recent empirical studies directly examining overdose disparities by sexuality or beyond an assumed gender binary (e.g., cisgender men vs. cisgender women). Nevertheless, a recent review of opioid-related outcomes (i.e., opioid misuse and opioid use disorder) among lesbian, gay, bisexual, transgender, and other gender and sexual minorities found that none of the 113 articles identified (published between 2011–2020) reported opioid overdose outcomes [28•].

Lifecourse Stages

Research has noted increases in opioid overdose among older adults in the United States, with deaths per 100,000 people ≥ 55 years old increasing from 0.90 in 1999 to 10.70 in 2019. In this study, overdose rates by gender and race/ethnicity varied greatly, with age-adjusted fatality rates for non-Hispanic Black men ≥ 55 years old reaching 40.03 per 100,000 by 2019, four times higher than the overall rate among older adults [29]. In contrast to the total men and women populations, deliberate overdose deaths in 15–24-year-olds have also increased [30]. These reports indicate that adolescents (and their families) may require expanded harm reduction outreach [23].

Disability

Although older research found that Medicare patients admitted to hospitals for opioid poisoning and overdose deaths were more likely to be disabled [31, 32], disability status is relatively understudied in recent overdose research. However, one recent study identified a significant association between adults eligible for Medicare due to disability and overdose mortality [33•], and another found elevated fatal overdose rates in U.S. counties with higher proportions of disabled individuals and those lacking health insurance [34]. It is possible that disability and related factors such as unemployment, poverty, and aging, may influence substance use and exacerbate overdose risk [33•].

Research Gaps

Several research gaps are apparent in the literature on identity-based and socio-demographic dimensions of fatal overdose disparities. Relatively little evidence exists on the potential roles of sexuality, lifecourse stages, and disability in overdose disparities. Drawing from an intersectional framework and the documented, intersecting forms of marginalization experienced among sexual and gender minority-identifying individuals of color (e.g., racism, homophobia, transphobia) that can influence substance use behaviors [35], additional research on overdose disparities by sexual orientation and gender identity is urgently needed [36]. In addition, intervention research considering the various barriers and biases (e.g., ageism) that older adults face when seeking substance use disorder treatment, health, and harm reduction services is needed [37]. Finally, more research on the mechanisms underlying the observed associations between specific dimensions (e.g., disability) and overdose disparities proposed in this literature (e.g., unemployment) is needed.

Potential Structural Drivers of Fatal Overdose Disparities

Also supporting the use of an intersectional framework [6, 7], we summarize potential structural drivers of overdose disparities, including housing status, law enforcement interactions, poverty and unemployment, and disparities in prevention and treatment service access, as described in the sections below.

Housing Status

Drug-related overdose is a significant cause of mortality among unhoused individuals in the United States, who may

experience up to 30 times the risk of fatal overdose than the general population [38•]. A study in Boston, Massachusetts, found that fatal overdose accounted for 1 in 4 deaths among persons experiencing homelessness, and that overdose mortality had increased significantly in this population between 2004 to 2018, largely due to synthetic opioids (e.g., fentanyl) and polysubstance use [38•]. A recent modeling study of involuntary displacement, including "sweeps" of homeless encampments, in 23 U.S. cities estimated that between 974–2175 additional fatal overdoses could occur per 10,000 people at 10 years with continual involuntary displacement [39]. From an intersectional lens, people experiencing homelessness have high levels of substance use disorders, medical and psychiatric comorbidities, disabilities, and poverty and unemployment, and homelessness and housing insecurity disproportionately impact Black and Hispanic communities due to historical "redlining" and other forms of structural racism noted above [14, 15].

Law Enforcement Interactions

Research in the United States and other settings (e.g., Canada) has highlighted the role of interactions with law enforcement on overdose disparities [40]. In one U.S. study, neighborhoods in Delaware with elevated levels of drug selling and possession arrests had the highest number of opioid-related overdose deaths [41]. A recent scoping review also highlighted the elevated risk for overdose among people who have been previously incarcerated [42]. Conversely, emerging research suggests that engaging police officers, with adequate training in using naloxone and conducting post-overdose outreach, can benefit some populations at risk [43]. As law enforcement is at least partially responsible for implementing drug laws and policies, and the racist histories of incarceration and U.S. immigration policies have been well-documented [10], existing literature clearly positions law enforcement interactions as a structural driver of overdose disparities, while intervention targets in this area continue to be explored.

Poverty & Unemployment

A systematic review of 37 papers on opioid-related overdose identified relationships between numerous markers of socio-economic marginalization (i.e., insurance status, criminal justice involvement, education, social support, income, and socio-economic status [SES] composite measures) and fatal overdose [44]. People of color are more heavily represented in low-income overdose fatality rates than non-racialized populations, and overdose rates are higher in low-income jurisdictions. Other recent studies have also identified unemployment as a significant risk factor for overdose [34, 45, 46]. While there are multiple challenges pinpointing the precise underlying mechanisms through which poverty and unemployment increase fatal overdose, some of the studies included in this review (e.g., [45]) have posited that increased stress and limited healthcare access likely play important roles.

Prevention and Treatment Service Access

We also identified literature on disparities in access to overdose prevention strategies and supplies including naloxone, with multiple studies finding that Black and Hispanic individuals are less likely to receive naloxone than White individuals [47–49]. Also pointing to potential disparities in prevention and harm reduction service access, naloxone training was less-frequently received among Black than White women in one study [50]. Additionally, abundant evidence exists on the pronounced racial and ethnic disparities in access to evidence-based treatments for substance use disorders including medications for opioid use disorder (MOUD), with a large body of literature documenting lower levels of MOUD coverage in Black and Hispanic populations compared to White populations [51, 52], with intersecting and potentially exacerbated disparities by income and geographic area [53], disability status [51], and gender and pregnancy status [54–56] among other factors.

Research Gaps

The literature included in this section points toward important knowledge gaps regarding potential structural drivers of fatal overdose disparities. Regarding housing status, intervention strategies for the U.S. context are urgently needed; indeed, a recent review on "Housing First" initiatives, which prioritize permanent housing regardless of substance use status, concluded that overdose outcomes require additional research [57]. Next, as law enforcement interactions appear to largely promote overdose disparities, additional research is needed to confirm hypothesized mechanisms and evaluate ongoing efforts to engage law enforcement in positive ways. Similarly, existing literature connecting poverty and unemployment to overdose disparities has not yet elucidated the mechanisms involved; more precise identification of these mechanisms would help identify critical intervention targets. Finally, as others have argued [52], additional research exploring pathways through which race, ethnicity, and other specific forms of identity and marginalization result in observed disparities in prevention and treatment service access will be imperative given the strong evidence that these services reduce fatal and non-fatal overdose in vulnerable communities.

Data Limitations Challenging Fatal Overdose Disparities Research

Through this narrative review, we identified common data limitations that challenge fatal overdose research, including missing data, inaccurate reporting on race and ethnicity and other identifiable factors, and reporting delays.

Common Data Limitations

Most of the studies included in this review included quantitative data on overdose disparities for which investigators described major data limitations in several key areas. First, a large percentage of U.S. overdose mortality data is missing substance-specific information, implying that literature on opioid-related overdose may be characterized by underestimates, particularly for certain sub-populations. For example, women may be more likely than men to be prescribed opioids for pain, yet women were 40% more likely to have missing substance-specific information in overdose mortality data [58]. Second, inaccurate reporting or missing data on race and ethnicity is another barrier to assessing overdose disparities, with a particular omission of data on multiracial identities that has resulted in small numbers and the purposeful exclusion of multiracial categories in overdose research [59••]. For instance, an estimated 40% of race and ethnicity reporting on death certificates for AI/AN populations are inaccurate[60]. Third, reporting delays (due to medical examiner backlogs, extensive toxicological studies, or data processing delays) also present a significant challenge to overdose research, particularly for data disaggregated by race, ethnicity, and other dimensions of disparities [38•].

Research Recommendations

Given the importance of mortality data in quantifying fatal overdose disparities, improved data infrastructure for the gathering and reporting of consistent and accurate data is urgently needed [61, 62]. Research findings also point to the need for additional qualitative data on overdose disparities that can bolster and supplement the quantitative data used in overdose reports [52]. Furthermore, as race is a socially constructed category, care must be taken when reporting disaggregated data to prevent interpretations of racial statistics as supporting nonexistent genetic differences [63].

Promising Strategies to Reduce Fatal Overdose Disparities

As a final component of our review, we identified several categories of recommendations for interventions and implementation strategies that may help reduce fatal overdose disparities and overdose rates overall, as summarized below in the sections on community-based harm reduction outreach, implementation science approaches, and drug law and policy reforms.

Community-Based Harm Reduction Outreach

Research supports the need for tailored efforts to expand equitable access to evidence-based harm-reduction services and supplies like naloxone and fentanyl test strips, particularly for populations impacted by overdose disparities who may require novel outreach strategies [48]. For example, researchers have recommended ways in which harm reduction services could be integrated into workplaces, churches, community gathering places, and sporting and entertainment venues to help reduce drug-related mortality among Black men, depending on the age group [64]. Accessible, community-based drug-checking services could also help reduce overall overdose rates and disparities [65], as research in other contexts (e.g., Canada) has found that individuals who witnessed an overdose were more likely to access drug checking services themselves [66], and drug checking could potentially reduce stigma related to drug use, mitigate harms from criminalization, and reduce overdose deaths [67]. Harm reduction vending machines (e.g., as implemented in Denmark since 1987), could also help increase access to naloxone and other harm reduction supplies for specific communities and reduce fatal overdose [68]. As the authors of a recent scoping review point out, additional research on the potential for harm reduction vending machines to reduce overdose disparities in the United States is needed [69].

Implementation Science Approaches

Implementation science strategies with an explicit equity focus have high potential to reduce overdose disparities [70]. For example, an ongoing HEALing Communities Study of community-level implementation strategies is using a data-driven approach to overdose prevention involving prioritizing groups with the highest risk of overdose, and then implementing overdose education and naloxone distribution and effective delivery of medications for opioid use disorder in the most relevant and accessible community settings and providing racial equity education [71, 72••, 73]. Specific implementation science strategies to improve equitable naloxone distribution are also being tested within syringe service programs [74•]; additional research on implementation strategies in community-based harm reduction settings should incorporate a specific focus on equity and tailored efforts to reach the most marginalized groups and reducing overdose disparities.

Drug Law & Policy Reforms

Along with interventions and implementation science approaches targeting individuals, organizations, and

communities, research indicates that drug law and policy reforms to reduce overdose should also be prioritized. For example, state-level "Good Samaritan" laws, which provide immunity from arrest or prosecution when individuals call for emergency services when witnessing an overdose may help address overdose disparities [75]. Federal laws that decriminalize drug use and possession and expand access to substance use disorder treatment services have also been proposed but not yet implemented or evaluated in the context of the U.S. overdose crisis [76•].

Based on emerging research, specific policies should also be targeted for de-implementation efforts. For example, so-called "stop-and-frisk" policing approaches, which have been blatantly discriminatory, have disproportionately targeted and resulted in the incarceration of Black men, likely exacerbating overdose disparities. At the state and federal levels, drug-control policies characteristic of the "War on Drugs" have banned individuals—disproportionately Black men with felony records—from accessing public housing and educational resources, thereby decreasing social stability, family support, and economic opportunity [77]. To avoid reproducing structural racism and its repercussions, including racialized stigma and incarceration, efforts are needed to ensure that drug law and policy reforms are aligned with the tenants of antiracist public health practices and supportive of increasing (not decreasing) access to evidence-based overdose prevention strategies, services, and supplies [78].

Research Gaps

Taken together, findings for this section point to the need for community-driven research on interventions to reduce overdose disparities that take an explicitly anti-racist stance (see for example Harm Reduction International's Anti-Racist Pledge [79]) and include more voices of people of color who use drugs and others who experience the intersectional forms of disparities described above. This research could benefit from beginning from a healing justice and liberatory harm reduction perspective (see for example the Vancouver Area Network of Drug Users' *Manifesto for a Drug User Liberation Movement* [80] or ideas presented in Shira Hassan's book, *Saving Our Own Lives* [81]). Finally, there is a need for both activism and implementation and dissemination science research that builds upon community experience and evidence to drive drug law and policy reform and the scaling up of evidence-based prevention and treatment services that reduce fatal overdose.

Conclusions

Our narrative review brings together literature that elucidates various intersectional dimensions of drug-related overdose in the context of the U.S. overdose crisis. Despite the limited research on some dimensions of identity and socio-demographics, an intersectional framework helps illuminate the social contexts and structural drivers lay ground for our observed overdose disparities. This review highlights the adverse impacts of racism, barriers to housing and healthcare services (including lack of health insurance), financial inequality, unequal policing practices and prevention and treatment service access, and various federal, state, and local drug laws and policies that perpetuate overdose and more general health disparities. Importantly, researchers have identified several key data limitations, including missing, inaccurate, and delayed data, that must be remedied to support improved overdose disparities research utilizing an intersectional framework. While such challenges should not prevent the utilization of currently available data, findings must be interpreted with caution as they may obscure even more significant overdose disparities than what have been noted here.

In conclusion, unequal access to healthcare, substance use disorder treatment, harm reduction and overdose prevention services, as well as inequities in financial resources, power, legal rights, and other factors have been linked to specific forms of overdose disparities that often interact in multiplicative ways. Community-based harm reduction outreach, implementation science approaches drawing from an equity lens, and major drug law and policy reforms are supported by emerging literature as potentially addressing some of the major structural drivers of overdose disparities; however, additional research is required. Nevertheless, reasons for hope include evidence-based interventions and implementation science approaches that are newly emerging in the United States (e.g., locally approved "overdose prevention sites" [82]) or are already being implemented and evaluated in other countries (e.g., "safe supply" initiatives [83]), and we recommend that these interventions be evaluated with a specific focus on intersecting disparities and health equity. Despite substantial progress on overdose disparities research in recent years, additional attention to intersectional dimensions of identity and structural drivers of overdose disparities is urgently needed.

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Declarations

Conflicts of Interest The authors declare that they have no conflicts of interest.

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