

Review

Pathways connecting socioeconomic marginalization and overdose: A qualitative narrative synthesis



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ABSTRACT

Purpose: This qualitative narrative synthesis sought to identify pathways connecting socioeconomic marginalization (SEM) and overdose for people who use drugs.

Methods: We included studies with qualitative examination of SEM and fatal and non-fatal overdose published in English between 2000 and 2021. Studies were systematically identified and screened by searching MEDLINE (Ovid), Embase (Ovid), PsycINFO (EBSCOhost), CINAHL (EBSCOhost), Google Scholar, Cochrane Central Registry of Controlled Trials (CENTRAL), and Cochrane Drug and Alcohol Group (CDAG) Specialized Registry, citations, and contacting experts. Risk of bias and quality assessments were performed using the Critical Appraisal Skills Programme checklist and the Confidence in the Evidence from Reviews of Qualitative Research approach. Data were synthesized using a thematic synthesis approach.

Results: The primary search strategy found 5909 articles that met the initial screening criteria. The review and screening process led to a final dataset of 27 qualitative articles. The four key findings of this narrative synthesis revealed aspects of SEM which shaped drug poisoning risk for people who use drugs: (1) resource insufficiency, labor market exclusion and deindustrialization, (2) homelessness and housing, (3) policing, criminalization, and interactions with emergency services, and (4) gendered and racialized dimensions of inequality. Findings led to creating a typology that includes material, behavioral, psychological, social, and environmental pathways that contain multiple mechanisms connecting SEM to overdose. This review revealed reciprocal connections between overdose and SEM via institutional pathways with reinforcing mechanisms, and interrelationships present within and between pathways. Quality assessments indicated moderate confidence in three of four findings (Findings 2, 3, and 4 above) and high confidence in one finding (Finding 1).

Conclusion: SEM is strongly linked to drug poisoning, and the mechanisms establishing these connections can be classified within four pathways. The interconnectedness of these mechanisms can lead to intensification of overdose risk and reinforcement of SEM itself.

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Introduction

As North America contends with the ongoing and intensifying drug overdose epidemic, opioid-related poisoning¹ continues to drive unacceptably high levels of morbidity and mortality (Wilson, 2020). Several dimensions of social and economic disadvantage have been linked to opioid poisoning as characterized by a recent systematic review which examined quantitative associations between socioeconomic marginalization (SEM; including inadequate income; labor market exclusion; informal or prohibited income generation; material insecurity) and overdose, finding associations present in 34 of 37 of the included studies (van Draanen et al., 2020). However, considerably less theoretical and empirical research explains *why* the connection between upstream social determinants and acute drug-related harm, such as overdose, exists and *how* such linkages operate. Understanding the mechanisms and pathways by which SEM is connected to opioid-related poisoning is critical to effectively intervening to stem the catastrophic human toll of the ongoing epidemic (Centers for Disease Control & Prevention, 2021). Tragically, data from across North America indicate a sharp increase in poisoning deaths and a worsening of the overdose epidemic coinciding with the onset of the COVID-19 global pandemic (BC Coroners Service, 2020; Centers for Disease Control & Prevention, 2021; Slavova et al., 2020), rendering the need to understand this relationship and identify potentially effective interventions as urgent as ever.

People who use drugs (PWUD) commonly experience SEM through various circumstances that exclude them from social and economic opportunities and create disadvantage. Conditions that are associated with SEM, such as homelessness (Fischer et al., 2004), living with HIV (Brette et al., 1997; Green et al., 2012; Stewart et al., 2004), incarceration (Green et al., 2012; Stewart et al., 2004), racial discrimination (Jongbloed et al., 2017; Milloy et al., 2010), low-income (Galea et al., 2006; Lanier et al., 2012; Silva et al., 2013), low educational attainment (Ho, 2017; Lanier et al., 2012; Silva et al., 2013), labor market exclusion (Richardson et al., 2015; Richardson et al., 2014), involvement in illegal and informal income generation (Ti et al., 2014), synchronized administration of income assistance payments (Krebs et al., 2016; Otterstatter et al., 2016; Zlotorzynska et al., 2014), and material insecurity (Ompad et al., 2012) have all been linked to overdose. However, most observational quantitative studies identify associations rather than the individual, social, and structural pathways connecting these elements to drug poisoning. Consistent with delineations of the explanatory capacity of different methodological approaches (Creswell & Creswell, 2017), qualitative research is needed to decipher the *how* and the *why* of the relationship between SEM and overdose. Given the critical role of qualitative reviews in understanding complex risk, unique configurations affecting different subpopulations, and the role of context (Noyes et al., 2018), this qualitative narrative synthesis was designed to identify, examine, and systematize identified mechanisms and pathways linking SEM and overdose to aid policy and decision making in the overdose crisis.

Existing frameworks for understanding SEM and overdose

Social determinants of health are thought to be connected to health outcomes in the general population (Brunner & Marmot, 2006) as well as for PWUD (Galea & Vlahov, 2002) through the material, behavioral, and psychosocial pathways (Brunner & Marmot, 2006) related to the control and distribution of socioeconomic resources. Brunner and Marmot's conceptual framework that links social determinants to health outcomes via these three pathways is widely used, but risks underempha-

sizing structural forces driving these relationships and is not specific to PWUD (Graham, 2004). When using a determinants of health framework like Brunner and Marmot's to explain health outcomes, it is essential not to overlook the distinction between the social factors that influence health and the social processes that determine their unequal distribution (Graham, 2004). Such blurring may contribute to the assumption that health inequities, in this case inequities in drug poisoning outcomes, can be diminished by policies that focus only on the social determinants of health without attention to whether and how these policies may affect different populations differently (Graham, 2004). For example, focusing on increasing employment opportunities for PWUD while ignoring structural racism and its role in inequitable drug poisoning outcomes for people of color may reduce the number of poisonings overall but leave inequities in the distribution of overdose morbidity and mortality by race/ethnicity linked to labor market participation intact. Thus, more specific theoretical frameworks that detail how SEM contributes to the production of inequities in overdose outcomes and the conditions that produce SEM for PWUD are needed.

Ecological heuristics outlining determinants of risk specific to PWUD have been established and are critical in situating the current review. For example, the risk environment framework proposed by Rhodes involves thinking about drug harms such as overdose as products of situations and environments in which individuals engage (Rhodes, 2002; Rhodes, 2009). This conceptual heuristic incorporates the role those situational characteristics play across physical, social, economic, and policy domains in producing and reproducing risk for drug-related harms like an overdose (Rhodes, 2009).

Collins and colleagues have proposed considering the 'intersectional risk environment' as an approach to understanding how physical, social, economic, and policy contexts converge to produce or mitigate drug-related outcomes (Collins et al., 2019). This framework integrates a relational, intersectional lens to examine outcomes across populations of PWUD as products of social location and processes operating across social-structural dimensions that are embodied, reflected, and challenged while situated within social, historical, and geographic contexts (Collins et al., 2019).

The frameworks proposed by Brunner and Marmot, Rhodes, and Collins and colleagues all remain conceptually valuable for setting a foundation detailing the mechanisms and pathways that are at play in connecting SEM to drug poisoning. However, because they are designed to offer a lens through which to conceptualize relationships within a system rather than operate in explanatory or predictive ways, they must be paired with explanatory theoretical models or be applied to specific phenomena – as we do in this study – to provide the specificity in mechanisms and pathways that is critically necessary for intervention development.

The accumulation, persistence, and reinforcement of marginalization

Investigating phenomena with a cumulative advantage/disadvantage lens calls attention to the patterned accumulation of experiences of marginalization over time, resulting in a continuation and exacerbation of disparities across institutions and the life course (Dannefer, 2003). For example, experiencing poverty early in life can create chains of disadvantage that begin in childhood and persist over the life course, shaping trajectories and transmitting SEM through generations (Elder et al., 2003). Individuals who experience SEM are more likely to have negative experiences within key institutions that are important for each stage of life (e.g., family, school, work, law), leading to further rejection, discrimination and challenges. The way that systems of marginalization interact to affect overdose for PWUD is not clear. Further research is thus needed to highlight the patterns that drive disparities in overdose outcomes over time (Dannefer, 2003) and the way that multiple mechanisms connect together to form risk amplifying or mitigating pathways.

¹ We use the terms "overdose" and "poisoning" interchangeably throughout this review to refer to the toxic ingestion of opioids. In response to the increasing toxicity of the drug supply, the language used to refer to toxic ingestion of opioids is evolving with the emergent term "poisoning" preferred by many of those who experience and respond to overdose.

Mechanisms and pathways connecting SEM and overdose

Social mechanisms—the processes by which cause-and-effect relationships in the social world come about—are best thought of as chains of these cause-and-effect situations (Gross, 2009). To study mechanisms, then, entails breaking complex social phenomena into their parts to see how chains of actors “employing habits” resolve situations to bring about systematic effects (Gross, 2009). Studying such mechanisms can result in better specified, more robust, explanatory accounts (Gross, 2009). If mechanisms are the processes by which cause and effect relationships are enacted, then pathways can be thought of as groupings of mechanisms that act in similar ways.

Current study

In the current study, we seek to apply existing frameworks to identify the mechanisms connecting SEM and overdose and describe the overarching pathways to which they belong by systematically synthesizing existing qualitative literature in this area. Therefore, we use Rhodes', Brunner and Marmot's, and Collins' frameworks as starting points to guide the scope of this narrative review. We draw attention to not only the social and economic conditions that shape inequity in drug-related harms, but also the policies that produce and reproduce such conditions (Dasgupta et al., 2018) and the interaction of these factors with local contexts and the agency of individuals (Rhodes, 2009). Our review question is, “How does socioeconomic marginalization shape overdose risk for people who use drugs?”

Methods

Question formulation

Our qualitative review protocol development was undertaken as a process of “problem framing” (Harris et al., 2018). We first constructed a preliminary outline that incorporated existing conceptual work to identify the different domains in which pathways linking SEM and overdose may be operating. The relevance of theoretical perspectives of cumulative advantage and disadvantage (Dannefer, 2003) prompted a line of inquiry to look at the interrelationships between different elements of SEM and how they play out across time. The risk environment heuristic that we incorporated (Rhodes, 2009) also led to a line of inquiry about exposures linked to SEM that are structural and a qualitative analytic framework that focused on the socially situated and intersectional nature of risk. This preliminary outline led us to identify potential lines of inquiry for our research question, detailed below, an essential first step that served as a lens for identifying, selecting, and interpreting data in qualifying articles (Harris et al., 2018).

Consistent with best practices in qualitative syntheses (Harris et al., 2018), this project was designed to include meaningful collaboration with stakeholders in Canada at the local, municipal, provincial, and national levels. In addition to our conceptual framing, we consulted consistently with key policy stakeholders from relevant government ministries. All researchers and stakeholders met regularly throughout the project to allow for opportunities to refine review questions and methodology, interpret review findings, identify gaps, craft recommendations, and disseminate review findings together. The review's problem identification, lines of inquiry, and scope were explicitly designed to help knowledge users prioritize areas for social and socioeconomic intervention in the ongoing drug poisoning public health crisis.

To specify our research question, we used the PECOS framework (Population, Exposure, Comparison, Outcome, Study Design), which is highly specific and sensitive in quantitative and qualitative reviews (Methley et al., 2014), as seen in Table 1.

Search strategy

Although we focused exclusively on qualitative literature in this paper, this review began within a larger systematic literature review

that included both qualitative and quantitative evidence (quantitative findings published separately; see van Draanen et al., 2020). Mixed methods studies were included in both reviews, but qualitative findings were excluded from the quantitative review and extracted and analyzed specifically for the current narrative synthesis. We developed our methodology prospectively and published our review protocol in PROSPERO (registration # CRD42018096392). Using the Systematic Reviews and Meta-Analyses (PRISMA) checklist, the search sought studies that included measures of SEM and fatal and non-fatal overdose published in English peer-reviewed journals or by governmental sources between January 1, 2000 –January 4, 2021. Studies were systematically identified and screened by searching MEDLINE (Ovid), Embase (Ovid), PsycINFO (EBSCOhost), CINAHL (EBSCOhost), Google Scholar, Cochrane Central Registry of Controlled Trials (CENTRAL), and Cochrane Drug and Alcohol Group (CDAG) Specialized Registry, citations, and contacting experts. We performed two types of de-duplication: removal of identical records retrieved from multiple databases, and carefully examining multiple articles published from the same data set before deciding on their inclusion. To remove identical records, we used automated deduplication within EndNote Software, followed by manual deduplication with scanning for duplicate titles in the EndNote library. The number of studies retained in each step of the review process can be found in the PRISMA flow diagram in Fig. 1.

Articles were included if they had a study design that involved original qualitative data analysis and if they discussed experiences of SEM in relation to overdose risk. Given our integrated knowledge translation approach with policy makers, we prioritized articles from geographic regions that have comparable policy contexts to our own, especially, Europe, North America, and Australia. Retrieved relevant articles were treated as a “starting point” for supplementary search techniques such as citation searching and reference chasing (Papaioannou et al., 2009).

Our qualitative review sought to achieve “conceptual saturation” as a primary aim, which supplemented our quantitative review aim of locating and including all relevant articles to determine the strength and direction of associations present between SEM and opioid overdose (van Draanen et al., 2020). Although we have used PECOS criteria to guide our search and sample selection process, we deviated in the typical application of PECOS criteria in our qualitative review by using reviewer judgment in determining whether or not the core concepts of the review were sufficiently focal in the included studies. For example, in Fig. 1 we have included in “irrelevant exposure” all of the qualitative studies for which SEM and overdose was not substantially investigated. Given that our purpose was more explanatory than predictive, we focused on a purposive rather than an exhaustive sample to achieve conceptual saturation (Thomas & Harden, 2008). The strength of our findings thus reflects a high degree of information relevance, richness and “thickness” of detail (Booth et al., 2013). Therefore, decisions about relevance and irrelevance of the “exposure” were made not just based on definitions of concepts included, but also centrality of the concept of SEM to the study, and the relative value of the information about SEM and overdose presented in each study (Noyes et al., 2018). Similarly, decisions about relevance and irrelevance of the “population” and “outcome” sometimes included discretion, for example, based on the need for inclusion of specific elements of context (e.g., the perspectives of friends and family members in addition to PWUD) and whether or not subgroups were well represented (Noyes et al., 2018). The primary search strategy found 5909 original articles that met the initial screening criteria. The review and screening process led to a final dataset of 27 qualitative articles.

Data collection and extraction

Two independent reviewers conducted title, abstract and full text review, if determination of relevance could not be made based on title and abstract, for each record retrieved. Reviewers used a standard-

Table 1
Systematic review search strategy¹ and qualitative PECOS criteria.

Search Concepts	Individual-level SEM: social class, socio-economic status; low education; unemployment, labour/labor market exclusion; material insecurity, material hardship; housing insecurity, homelessness, unstable housing; hunger, food insecurity; health care access, social service access; poverty and income inadequacy; social assistance, income assistance, welfare, disability; prohibited income generation (e.g., theft, drug dealing, street-based work); early childhood development; incarceration, criminal justice system involvement; persistent disadvantage, vulnerability, stigma, social isolation, social exclusion, marginalization. Structural-level SEM: service barriers and availability, location of social services, health care service availability and accessibility; housing availability, housing affordability; urbanization, neighborhood disorder; disparities, income inequality, wealth inequality, neighborhood median income; synchronized social assistance, (“cheque day effect” or “check effect”); welfare, disability, and income assistance policies; criminal justice and drug policies. Overdose (fatal and non-fatal): poisoning, drug-related poisoning, side-effects/adverse reactions, toxicity, death, morbidity, mortality, overdose Opioids: People who use opioids (medical/non-medical), prescription and non-prescription, oral and injection
Databases	MEDLINE (Ovid), Embase (Ovid), PsycINFO (EBSCOhost), CINAHL (EBSCOhost), Google Scholar, Cochrane Central Registry of Controlled Trials (CENTRAL), and Cochrane Drug and Alcohol Group (CDAG) Specialized Registry
Other Search Strategies	In addition to searching electronic databases, additional searches on clinicaltrials.gov, a comprehensive grey literature search (e.g., https://deslibris.ca), conference proceedings (e.g., Harm Reduction International, American Public Health Association, etc.), and manual searches of reference lists of included studies were performed. Experts and community stakeholders were contacted to identify unpublished, ongoing and other studies not otherwise retrieved through searches for this review.
PECOS Criteria	<u>Population</u> : People who use drugs in North America, Europe, and Australia. <u>Exposure</u> : Any element of socioeconomic marginalization, as described above as a focal point in the article (i.e. poverty, income, education, and employment). <u>Comparison</u> : Qualitative studies discussing experiences of marginalization. <u>Outcomes</u> : Fatal and non-fatal overdose. <u>Study design</u> : Any study design including original qualitative analyses (or mixed methods studies with qualitative components). Case-reports, letters, commentaries, reviews, and editorials were excluded.

ized form to extract data from the included studies. Inconsistencies in the extracted data were noted by the research assistants and resolved by achieving consensus through discussion or referral to a senior team member for final determination if needed.

Data synthesis

Following data extraction, we conducted a process of thematic synthesis designed for qualitative narrative syntheses (Thomas & Harden, 2008) using NVivo 12.0, carried out in three stages. First, two team members independently coded the extracted text using a line-by-line method of coding with codes created inductively to capture the meaning of each sentence. After creating an initial code list, research team members looked for similarities and differences between codes and grouped them into a hierarchical tree structure. In some cases, new codes were created to capture the meaning of groups of initial codes. This process resulted in a tree structure with several levels of parent and child codes encompassing a set of descriptive themes.

Following the creation of descriptive themes, we inductively generated the four analytic themes presented in this manuscript. The descriptive themes remained close to the primary studies in language and framing, while the analytic themes were interpretive, going beyond the primary included studies to generate new constructs and synthesized meanings, drawing from the conceptual frameworks we used. This development of analytic themes was achieved by viewing the descriptive themes that emerged from our analysis alongside the review question and lines of inquiry. We then deduced the pathways and mechanisms inferred by the descriptive themes, a process that each researcher first did independently and then discussed together. This discussion iteratively produced the analytic themes, which we then compared back with the mechanisms and pathways initially identified, making changes and repeating the cycle as necessary.

Quality assessment

The data extraction process for this review included an assessment of bias and study quality, for which we used the qualitative checklist from the Critical Appraisal Skills Programme (Critical Appraisal Skills Programme, 2018). This review used the GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative Research) approach for evidence appraisal, which outlines four criteria for assessing the level of

confidence in the overall findings (Lewin et al., 2018;): 1) the methodological limitations of the individual qualitative studies contributing to an area of findings, 2) the coherence of the findings, 3) the adequacy of data supporting findings and 4) the relevance of the data from the primary studies supporting a finding to the context of our review question (marginalization and overdose for PWUD). For every review finding, each assessment criterion was categorized as having no or very minor concerns, minor concerns, moderate concerns, or serious concerns. We then assigned a confidence level to each finding based on these individual components, ranging from very low to high confidence. This independent assessment was conducted by two reviewers, who conferred to seek consensus before proceeding, involving a third team member when disagreements in categorization were found.

Results

Articles included in the review

A total of 27 articles were included in this narrative synthesis, and a summary of the included studies is available in Supplementary Table A. Eleven studies included participants from the United States, ten from Canada, three from Australia and three from the United Kingdom. Most studies ($n = 24$) collected data through individual interviews, seven through ethnographic observation, one used focus groups, and one from documentary materials (i.e., video footage, documents, recordings). None of the included studies were government reports or white papers. Included studies drew their samples from the general population of PWUD ($n = 12$), supervised injection facility (SIF) patrons ($n = 4$), clinical patients ($n = 4$), those who had witnessed overdose ($n = 3$), veterans ($n = 1$), shelter staff and residents ($n = 1$), family members of people who had experienced overdose ($n = 1$), clients of a harm reduction program ($n = 1$), and members of the broader community ($n = 1$). Some studies used more than one data collection method and sampled from populations that belong to multiple groups. Many included studies did not identify a theoretical model framework that guided their work, but for those that did ($n = 9$), almost all ($n = 8$) referenced the Rhodes (2002, 2009) Risk Environment Framework. One study also used a biopsychosocial framework, social epidemiological life course theory, and a “drug, set, and setting” framework (Zinberg, 1984). The four findings of this narrative synthesis span key domains relevant to SEM with documented linkages to opioid poisoning risks for PWUD: 1) resource insufficiency

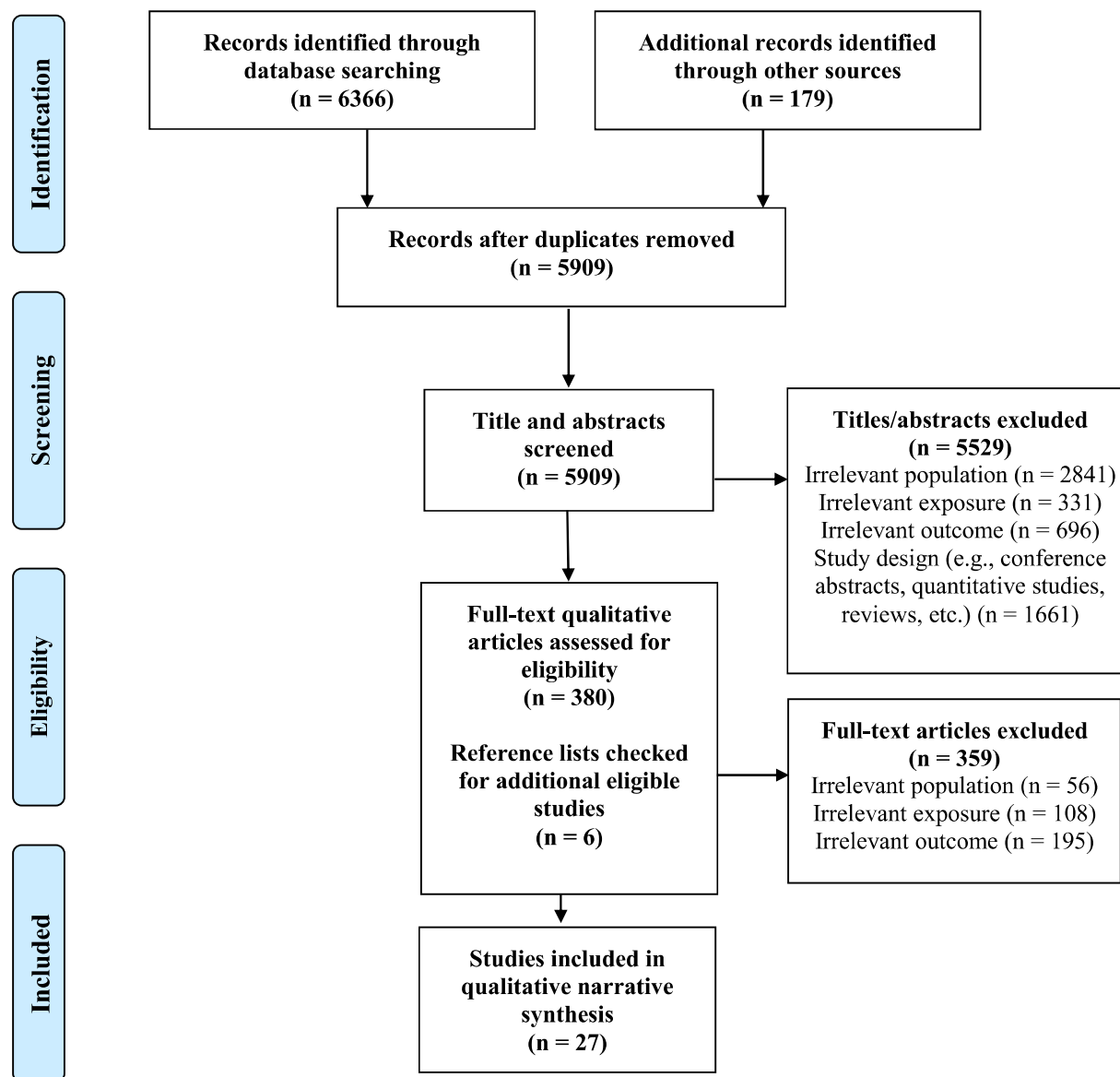


Fig. 1. PRISMA flow diagram.

and labor market exclusion, 2) housing insecurity, 3) drug criminalization, policing, and emergency services, and 4) gender and race-based inequity. These four findings led to creating a typology in which SEM is connected to overdose via material, behavioral, psychological, social, and environmental pathways that contain multiple specific mechanisms. The review identified interactions in mechanisms within and between pathways. Finally, our study also identified an institutional pathway that reinforces marginalization through the criminalization of substance use whose associated mechanisms demonstrate how experiencing overdose can also lead to SEM.

CERQual assessment of findings

Studies were assessed using the CERQual approach for evidence appraisal outlined above (see Table 2 for more detail). Given these assessments, we have moderate confidence in three of four findings (Findings 2,3, and 4), and high confidence in one finding (Finding 1). Below we detail each of the four review findings and subsequently describe a typology connecting the mechanisms and pathways present within them.

Finding 1: Resource insufficiency, labor market exclusion, and deindustrialization

Summary of review findings. Resource insufficiency and labor market exclusion exacerbated vulnerability to opioid poisoning through mechanisms of neighbourhood disadvantage, financial distress, precarious income generation, and financial barriers to overdose prevention and responses in included studies (Bennett et al., 2017; Kennedy et al., 2019; Mars et al., 2015; McLean, 2016; McNeil et al., 2014; Moore, 2004; Yarborough et al., 2016). This occurred through the material, behavioral, social, psychological, and environmental pathways (see Fig. 2 and Table 3 for a depiction of mechanisms and pathways). Several studies identified deindustrialization as an underlying cause of the aforementioned issues driving opioid poisoning (Mars et al., 2015; McLean, 2016; Sered, 2019; Trappen & McLean, 2021). We have a high level of confidence in this finding.

Neighbourhood disadvantage and deindustrialization. Multiple articles in the review described how local neighbourhood contexts, especially those characterized by disadvantage, poverty, and unemployment, influenced substance use patterns and contributed to poison-

Table 2
Summary of review findings and CERQual assessment.

Summary of review findings	Studies	Overall CERQual assessment of the quality of evidence ¹	Methodological limitations ²	Coherence ³	Adequacy of data ⁴	Relevance ⁵	Explanation of CERQual assessment
1. Resource insufficiency and labour market exclusion: Economic marginalization at the individual and neighbourhood level, including high levels of poverty and unemployment driven by deindustrialization, contribute to increased substance use and overdose due to lack of opportunities.	(Bennett et al., 2017; Kennedy et al., 2019; Mars et al., 2015; McLean, 2016; Yarbrough et al., 2016; Trappen & McLean, 2021; Sered, 2019; Dertadian et al., 2017; Holloway et al., 2018; Kerr et al., 2013; Sered, 2019)	High confidence	Minor concerns	None/very minor concerns	None-/very minor concerns	Minor concerns	Methodological limitations were cross-cutting, including an absence of reflexivity in all papers and the inability to assess ethical issues in four papers. Relevance was a minor concern: findings may be slightly more relevant to men based on participant demographics and lack of racial/ ethnic diversity of participants.
2. Housing insecurity: Housing insecurity contributes to overdose through higher-risk substance use environments that necessitate public drug use, provide motivation for use, include heavy peer influence and availability of opioids, and force concealment of opioid use.	(Bennett et al., 2017; McNeil et al., 2014; Moore, 2004; Dertadian et al., 2017; Holloway et al., 2018; Koester et al., 2017; Boyd et al., 2018; Wright et al., 2005; Ataiaants et al., 2020; Miller, 2006; Fadanelli et al., 2020; Small et al., 2007; Wright et al., 2006; Wallace et al., 2018)	Moderate confidence	Moderate concerns	Minor concerns	None-/very minor concerns	None/very minor concerns	Methodological limitations were present in each paper, including a lack of discussion about reflexivity in most. Appropriateness of data collection methods was difficult to assess for five papers. There were minor issues with coherence, as there was nuance in the relationship between housing and overdose risk in included studies.
3. Drug criminalization, policing, and emergency services: Drug criminalization and policing tactics lead PWUD to adopt less safe drug-related behaviours when injecting in public or witnessing a poisoning which increases overdose risk and fatality to avoid police interaction, emergency service utilization, and legal consequences.	(Collins et al., 2019; McNeil et al., 2014; Moore, 2004; Trappen & McLean, 2021; Dertadian et al., 2017; Holloway et al., 2018; Koester et al., 2017; Boyd et al., 2018; Jozaghi, 2013; Fadanelli et al., 2020; Small et al., 2007; Wright et al., 2006; McLean, 2018; Kerr et al., 2007; Jozaghi, 2012)	Moderate confidence	Moderate concerns	Minor concerns	Minor concerns	Moderate concerns	The possibility of narrow relevance of the data was a concern, as most findings about public injection came from impoverished urban areas. Methodological limitations were present where most studies lacked information about reflexivity, and recruitment may have been driven by convenience in several studies. There were few concerns with coherence or adequacy of data.
4. Gender and race-based inequity: Socioeconomic marginalization intersects with gender and race-based disadvantages such as exposure to violence, gendered substance use dynamics, and inequitable access to harm reduction services, to vary risks by gender and shape unique poisoning risks for women who use drugs	(McNeil et al., 2014; Sered, 2019; Boyd et al., 2018; Ataiaants et al., 2020; Fadanelli et al., 2020; Fairbairn et al., 2010)	Moderate confidence	Minor concerns	None/very minor concerns	Moderate concerns	Moderate concerns	The narrow relevance of the data was a concern affecting confidence in this finding, many included studies recruited from highly localized populations, and limited information was included on the experiences of trans, gender diverse, non-binary, or two-spirited populations. Methodological limitations were present as studies lacked information about researcher reflexivity.

Notes:

¹ Criteria: Very low, low, moderate, or high confidence (Noyes et al., 2018).

² The extent to which there are concerns about the design or conduct of the primary studies that contributed evidence to an individual review finding;

³ An assessment of how clear and cogent the fit is between the data from the primary studies and a review finding that synthesises that data;

⁴ An overall determination of the degree of richness and quantity of data supporting a review finding;

⁵ The extent to which the body of evidence from the primary studies supporting a review finding is applicable to the context specified in the review question.

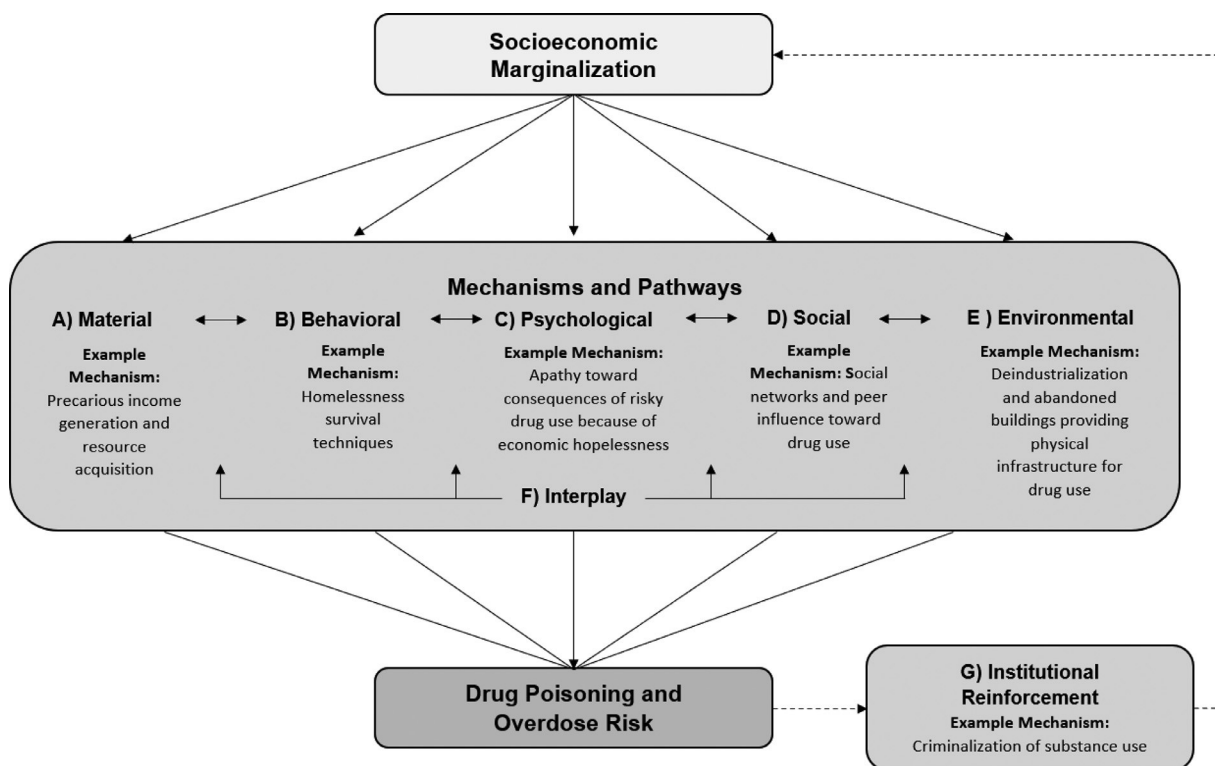


Fig. 2. Four dimensions of socioeconomic marginalization create elevated overdose risk via material, behavioral, psychological, social, and environmental pathways.

ings (Dertadian et al., 2017; Holloway et al., 2018; Mars et al., 2015; McLean, 2016; Trappen & McLean, 2021; Yarborough et al., 2016). McLean (2016), noted the effects of deindustrialization in McKeesport, Pennsylvania, which left the city struggling with high unemployment, poverty, and substance use. Participants described the city as a “depressing environment” where drugs filled economic and social voids (p. 25):

[Opioid poisoning] and addiction more generally, emerge in the above interviews as the backdrop to life in a poor city with a seemingly terminal prognosis. The data further reveals the ways in which pathways into drug use are shaped by a deindustrialized context: how a vacuum of opportunity, social support, and hope may be met by an expanding illicit drug market that offers both employment and recreation.

Similarly, Sered (2019) explained how the decline of good-paying blue-collar union jobs in a suburban Massachusetts town contributed to the proliferation of substance use. In addition to direct financial loss (a material pathway), the economic transformation also impacted social cohesion in the community and resulted in the loss of social capital (a social pathway). In contexts where economic trends led to neighbourhood-level labor market exclusion, drugs saturated the deindustrialized local environment, increasing consumption and poisonings (McLean, 2016; Sered, 2019; Trappen & McLean, 2021). Other articles in the review linked drug use to neighbourhood characteristics (Dertadian et al., 2017; Holloway et al., 2018; Mars et al., 2015). Mars et al. (2015), described how structures within an impoverished neighbourhood in Philadelphia facilitated substance use, as abandoned factories provided the physical infrastructure for drug transactions and sex work. In neighbourhoods with high levels of unemployment and poverty, drug dealing emerged as an economic opportunity. Thus, while drug poisoning was not confined to economically disadvantaged communities, those impacted by labor market transformations of deindustrialization were particularly vulnerable due to the lack of alternative opportunities and the availability of illicit and highly toxic substances. These vulnerabilities were exacerbated by the COVID-19 pandemic, which contributed to further

labor market destabilization (Trappen & McLean, 2021). Thus, SEM at the neighbourhood level led poor communities to become susceptible to opioid poisoning, through the material, social, and environmental pathways.

Financial distress and precarious income generation. While broader environmental trends like deindustrialization shaped community- or neighborhood-level outcomes, poverty and financial distress were also experienced at the individual level, contributing to drug poisoning vulnerability through material, behavioral, and psychological pathways. Participants in the reviewed studies described challenging financial situations triggered by job losses which led to opioid poisoning; sometimes these intersected with mental health issues, criminalization, and other forms of distress (Bennett et al., 2017; Kennedy et al., 2019; Yarborough et al., 2016). In a research study with veterans living in New York City, Bennett et al. (2017) found that financial struggles were a condition which intersected with other distal causes to create a context in which direct antecedents of overdose occur. According to Bennett et al. (p.1707), “mental health problems, social distress, and financial concerns in the face of escalating opioid dependence, motivated transitions to heroin” (Bennett et al., 2017). Similarly, a US study with overdose survivors and family members of decedents found that financial insecurity caused by unemployment was an event which commonly preceded fatal poisoning (Yarborough et al., 2016). Under economic distress and resource instability pressures, substance use offered a coping mechanism for difficult circumstances. These psychological factors shaped cues for substance use and led to hopelessness associated with ambivalence about the risks of consuming highly toxic opioids, through a psychological pathway.

Amid situations of financial distress and formal labor market exclusion, precarious income generation activities often emerged as economic survival strategies for PWUD. However, participation in the underground economy introduced additional risk. Moore (2004) described how some of the hazards encountered with street sex work made it difficult to adopt overdose prevention strategies and involved assessing risk

Table 3
Pathways and mechanisms through which socioeconomic marginalization creates elevated overdose risk.

Pathway	A) Material	B) Behavioral	C) Psychological	D) Social	E) Environmental	F) Interplay	G) Institutional
Definition	Material resource deprivation or inadequacy because of SEM	Individual behaviors influenced by SEM	Mental and emotional conditions precipitated by SEM	Social dynamics and interactions linked to SEM	Environmental conditions, structures, settings, and exposures created by SEM	Interactions between pathways that exacerbate existing risks of SEM	Institutional responses to the criminalization of substance use that reinforce SEM
Mechanisms	Job loss or financial trouble reducing material resources; Precarious income generation and resource acquisition; financial or housing-related barriers to harm reduction services	Homelessness survival techniques; increased pressure toward substance use related risk behaviors	Drug use for coping with SEM-related distress; apathy toward consequences of risky drug use because of economic hopelessness	Social networks and peer influence toward drug use; gender-based and exploitative injecting relationships; male-dominated harm reduction spaces reducing access for women; feminization/racialization of poverty	Deindustrialization and abandoned buildings providing physical infrastructure for drug use; widespread neighbourhood drug use and availability; rushed public injections to avoid police interactions in low-income neighborhoods; housing environments causing isolated use; fear of calling EMS; incarceration leading to reduced opioid tolerance	Loss resulting in reduced material resources (Pathway A) can cause anxiety (Pathway C), while also influencing environmental factors such as living arrangements (Pathway E)	Criminalization of substance use; policies that exclude PWUD from housing, employment, and social assistance; and increased surveillance and police presence in marginalized communities all reinforce the connection because they increase SEM after overdose experiences and exposures

priorities (McNeil et al., 2014; Moore, 2004). Further, the “emotional numbing qualities of heroin” offered a behavioral coping mechanism to deal with the emotional toll of street-based sex work described by Moore (2004). Describing the context of drug poisoning prevention in an Australian community, Moore (p. 1551) explained that “[drug poisoning] prevention messages, when considered in the context of the St. Kilda street-based drug and sex-work scene, ignore the complexity of risk practices” (Moore, 2004), referring to a long list of possible risks that participants encountered and mitigated daily (e.g., avoiding arrest, assault) of which overdose was just one. Therefore, the urgent need for financial survival, mitigating risks of violence, and emotional relief for those involved in precarious income generation activities were sometimes prioritized ahead of other safety concerns (such as the injection of drugs with unknown purity) (McNeil et al., 2014). Thus, financial insecurity amplified drug poisoning risk by shaping the contexts surrounding substance use cues and behaviors through a behavioral pathway.

Financial barriers to drug poisoning prevention. Resource insufficiency also influenced whether individuals acted to prevent or respond to an opioid poisoning to avoid fatality. In a US-based study, McLean (2016) found that the cost of naloxone was prohibitive for low-income people, ranging from \$40 to \$75. The cost of emergency medical services in this context also disincentivized individuals from calling emergency services during a drug poisoning event (Koester et al., 2017). Additionally, in other contexts, the high cost of illicit drugs prevented individuals from adopting safer drug use practices, as described by a study conducted in Vancouver, Canada (p. 1274):

Although nearly all participants expressed awareness that it was safer to inject with someone else, most said that their heavy dependence and limited financial resources meant they were unable to adhere to cultural norms dictating that one should share their drugs with others (Kerr et al., 2013).

Thus, financial deprivation was a barrier to effective overdose prevention practices.

Finding 2: Homelessness, housing and opioid poisonings

Summary of review findings. Numerous studies found that PWUD who lack secure housing experience increased opioid poisoning vulnerability (Bennett et al., 2017; Boyd et al., 2018; Dertadian et al., 2017; Jozaghi, 2013; Mars et al., 2015; McLean, 2016; Moore, 2004; Wright et al., 2005). These risks emerged through the following mechanisms: substance use cues emerging from the discomfort and distress caused by homelessness, exposure to the heightened risks of public injection environments, peer influence and widespread opioid availability in group living arrangements, and housing policies which led to forced concealment of opioid use. These mechanisms occurred via behavioral, social, and environmental pathways and, in some cases, were reinforced through institutional mechanisms. We have a moderate level of confidence in this finding.

Substance use cues. Included studies documented how homelessness shaped substance use rationales: for some homeless individuals, heroin was used to address discomfort when sleeping on the street as it provided physical comfort and a way to cope with distress related to unstable housing (Ataia et al., 2020; Wright et al., 2005). Experiences of homelessness also contributed to using opioids as a coping mechanism for the distress of SEM and apathy towards drug poisoning, as described by a participant in Miller’s article (p.442) (Miller, 2006): “You’re broke all the time. You haven’t got a roof over your head or you haven’t got money for food. You just get sick of the lifestyle.” While similar to the substance use cues and coping mechanism themes discussed earlier with respect to financial distress, these studies referred specifically to homelessness as a driving factor in the behavioral and psychological pathways.

Homelessness and injection risk environments. Housing status also shaped the risk environment of drug injection and increased drug poi-

soning risk through an environmental pathway. Homeless individuals often had no option other than injecting in public which increased their vulnerability to drug-related harms and poisoning (Boyd et al., 2018; Dertadian et al., 2017; Fadanelli et al., 2020; McNeil et al., 2014). Individuals often rushed injections or consumed substances in secluded areas like back alleys to avoid getting caught. Rushed injections exacerbated risks as harm reduction techniques such as using new needles, carefully dosing, and cleaning the injection site were commonly bypassed for expediency. According to Small et al. who conducted a study with PWUD in Vancouver, Canada (p.33) (Small et al., 2007), “Users were aware of the health consequences of adopting expedient injection techniques, rather than the safest ones possible, and acknowledged the influence of public injection settings in discouraging safer injecting.” Further, injecting in a secluded area made it more difficult to be found by paramedics in the event of an emergency. While PWUD recognized the challenges and risks associated with public injecting contexts, there was often no alternative in areas without SIFs. As a participant in Jozaghi’s study in Montreal, Canada described (p.28), “we don’t do it to cause trouble; we do it because we have no other safe place to go” (Jozaghi, 2013). The consequences of homelessness for poisoning risk were in direct contrast to those who did not face SEM, as Dertadian and colleagues point out in their comparison with affluent populations in Sydney, Australia who, rather than inject, often used opioids orally and could conceal their use in private settings (Dertadian et al., 2017).

Precarious housing and group living arrangements. Socioeconomically marginalized individuals in the included studies commonly lived in low-income group housing situations, such as hostels and shelters, where group living arrangements led to escalations in overdose risk via a social pathway. These escalations were linked to peer influence and the increased availability of drugs (Bennett et al., 2017; Wright et al., 2005). US military veterans who experienced an opioid-related overdose described heroin initiation while living in a veterans’ shelter with widespread drug use (Bennett et al., 2017). Similarly, a study in the United Kingdom found that living in a hostel encouraged heroin consumption due to peer influence (Wright et al., 2005). Wright further described that (p.249) in a Northern city of the U.K., “Where users wished to move away from a drug using career, obtaining an independent tenancy was highlighted as crucial in helping them to address a drug problem” (Wright et al., 2005). However, independent housing could exacerbate risks for death if no one was present to respond to an overdose (Fadanelli et al., 2020; Wright et al., 2005). Despite being described as a setting of heightened drug poisoning risk generally, shelters and hostels were also identified as protective against drug poisoning fatality due to the increased likelihood of someone responding to a drug poisoning (Wright et al., 2005). Thus, while the social context of hostels encouraged increased drug use, it also increased the likelihood that someone could respond in the event of drug poisoning. This paradoxical relationship pointed to the challenges present in navigating countervailing mechanisms, while housing security could help reduce substance use cues, without other supports, it could also increase the lethality of drug poisoning events.

Criminalization and housing policies. In some included studies, intersections between drug prohibition and housing policy produced tensions that exacerbated drug poisoning risk. For example, some housing policies in the US allowed individuals to be denied, evicted, or banned from subsidized housing for drug-related activity (Koester et al., 2017). This policy led individuals to fear losing housing if they called emergency services in the event of overdose, contributing to risk of fatality. A woman who reversed an opioid poisoning in her apartment in Denver, Colorado in the US described this fear (p. 119): “If he wouldn’t have come around after the second shot, I would have had to call 911... Yeah, I have Section 8 housing here. I could have lost that” (Koester et al., 2017). This demonstrated an institutional reinforcement mechanism that intensified the relationship between overdose and SEM, as individuals could lose access to critical material resources if they experienced overdose. Similarly, patrons could lose their hostel room for drug use, a policy

which promoted hidden use and discouraged intervention in the event of overdose (Holloway et al., 2018; Wright et al., 2006). A study by Wallace et al. (2018) in a large urban center in Canada described how some homeless shelters contrarily provided harm reduction supplies yet prohibited drug use. The resulting incentive for concealment placed shelter residents at greater risk of drug poisoning (Wallace et al., 2018) and led to (p.85) “a microenvironment in which harm can be increased when residents do not feel safe to access supplies and fear repercussions or punishment for use.” Therefore, precarious housing situations and prohibitionist policies intersected to impact the risk of overdose fatality via an environmental pathway reinforced with an institutional pathway.

Finding 3: Police tactics, criminalization, and emergency service-related exacerbation of drug poisoning risks

Summary of review findings. Drug criminalization and policing tactics led socioeconomically marginalized PWUD to adopt less safe drug-related behaviours when injecting in public to avoid police interaction, which increased drug poisoning risk via a behavioral pathway. PWUD were also reluctant to contact emergency services when witnessing an overdose event due to fears of police interaction and legal consequences. Police interaction and public injection were disproportionately experienced by socioeconomically marginalized PWUD, due to the over-surveillance of people living in poverty and the lack of safe places to use drugs (Brayne, 2014; Pager, 2003). This finding was part of an institutional pathway that illustrated a reinforcement mechanism present in the link between SEM and drug poisoning, whereby experiencing opioid poisoning itself perpetuated marginalization, as coming into contact with institutions in the criminal legal system often had severe socioeconomic consequences (Pager, 2003). This finding came from studies across several different geographic contexts, including Canada, the United States, Australia and the United Kingdom. We have a moderate level of confidence in this finding.

Police surveillance, criminalization, and risk environment. Confrontations with police were described in several studies as being endemic of the ongoing criminalization of substance use and were of particular concern for people experiencing SEM due to disproportionate surveillance (Brayne, 2014). Fear of police encounters and criminal legal consequences among socioeconomically marginalized PWUD shaped the risk environment by contributing to drug use practices which exacerbate vulnerability to drug poisoning.

Included studies highlighted how marginalized PWUD contended with experiences of police harassment, including being ticketed for loitering (Jozaghi, 2013; McLean, 2018) or physically assaulted and pepper-sprayed (Dertadian et al., 2017; Moore, 2004; Small et al., 2007). Socioeconomically marginalized PWUD took great efforts to avoid being caught using drugs by officers, often at the expense of engaging in strategies to reduce the likelihood or fatality of drug poisoning. Jozaghi (2013) explained (p.27): “Participants attributed overdose to the fear of police and risk of arrest. [...] If [people who inject drugs] had a safe place to inject, they would have time to do a smaller dose that could ultimately prevent overdose death.” Rushed injections, using in isolated spaces, and consuming larger doses of drugs, are strategies which marginalized PWUD engaged in to evade police confrontation, which simultaneously elevated risks of drug poisoning (Dertadian et al., 2017; Jozaghi, 2013; Kerr et al., 2007; Small et al., 2007). Not having a safe place to inject free of police presence was a concern voiced by participants in many studies (Boyd et al., 2018; Dertadian et al., 2017; Jozaghi, 2013; Jozaghi, 2012; Kerr et al., 2007; McNeil et al., 2014; Small et al., 2007) and points to environmental pathways by which SEM led to drug poisoning.

Dertadian et al. (2017) found that similar to how higher socioeconomic status provided safe spaces to use drugs, higher socioeconomic status also was protective against exposure to policing-related harms. The capacity to avoid police was identified as a primary benefit of accessing SIFs (Boyd et al., 2018; Jozaghi, 2013; Jozaghi, 2012;

McNeil et al., 2014), illustrating the importance of material security conferred through service access. However, increased police surveillance near SIFs reported in one study deterred individuals from accessing services, increasing the risks of drug poisoning (Collins et al., 2019). Further, Collins et al. (2019) identified how this surveillance coincided and intensified surrounding the disbursement of income assistance payments and alongside neighbourhood gentrification, in Vancouver, Canada, highlighting how these tactics disproportionately harmed socioeconomically marginalized populations.

Incarceration. Several articles included in the review discussed drug poisoning risks specific to being incarcerated. Incarceration is more common for those experiencing SEM due to the criminalization of poverty (Herring et al., 2020), and drug poisoning was discussed in the reviewed articles as occurring often at the intersection of SEM and the criminal legal system. Abstinence while incarcerated was found to reduce drug tolerance and increase the risk of drug poisoning upon release (Ataia et al., 2020; Kerr et al., 2007; Koester et al., 2017; Mars et al., 2015; Wright et al., 2005). Further, Larney et al. (2017) described the way some PWUD in New South Wales, Australia cease substance use treatment before release from prison, which heightened the overdose risk. In a study conducted with 29 women in Philadelphia, Ataia et al. (2020) found that drug poisoning risks were heightened after release for women who lacked stable housing when they left prison. Incarceration also further deepened marginalization by contributing to homelessness (Herring et al., 2020) and creating barriers to employment (Pager, 2003). Thus, incarceration also reinforced drug poisoning risk factors linked to housing and labor market exclusion through the institutional reinforcement pathway.

Reluctance to contact emergency services and increased lethality of poisoning events. Because of fears that police would arrive on the scene which could lead to searches, identification checks, and subsequent legal consequences for bystanders, people witnessing a drug poisoning (who were often PWUD themselves) were reluctant to contact emergency services (Fadanelli et al., 2020; Holloway et al., 2018; Koester et al., 2017; McLean, 2018; Moore, 2004; Trappen & McLean, 2021; Wright et al., 2006). The mechanism of reluctance to contact emergency services when witnessing an overdose in relation to housing stability mentioned above was also identified independently of housing precarity in multiple studies in the review. Some of the studies supporting this finding were conducted in countries or states that had overdose “Good Samaritan Laws²” designed to provide some legal protection to those who seek help during an emergency, including protection from charges for drug possession (Health Canada, 2017; Substance Abuse & Mental Health Services Administration’s Center for the Application of Prevention, 2017). However, individuals in locations with overdose “Good Samaritan Laws” often lacked confidence that they and the drug poisoning victim would actually be protected. Further, (p.120) (Koester et al., 2017) found that:

The most immediate concern with regard to calling for EMS and having the police respond was not the fear that police would arrest the victim or witness for drug and/or paraphernalia possession, but the far more likely scenario that the police would run identification checks leading to arrest for outstanding warrants, or in the case of those already under correctional control, incarceration for violating the terms of their alternative sentence, probation or parole.

Thus, individuals feared that they would face punishment for past involvement with the criminal legal system if police were to arrive at the scene or incur charges that could jeopardize their access to social services and programs. When witnesses did inform emergency services, it

was often seen as a “last resort” or as part of a “call and leave” routine where someone would call emergency services and then immediately leave the scene (Holloway et al., 2018). Holloway et al. (2018) also found that participants in Wales worried that carrying a take-home naloxone kit could attract unwanted police attention and avoided carrying naloxone as a result – delaying the administration of naloxone in overdose events– which can have fatal consequences. These findings demonstrate the behavioral pathways through which policing and drug criminalization operate to reduce the agency that marginalized PWUD have to adopt behaviours that prevent fatal poisonings and the institutional pathways that reinforce them.

Finding 4: Gendered and racialized socioeconomic inequity and drug poisoning

Summary of review findings. Men more commonly experience substance use disorder and drug poisoning (BC Coroners Service, 2020); however, qualitative studies about SEM and overdose focused predominantly on gender-specific risks among women. SEM intersected with gender-based disadvantage, gendered substance use dynamics, and inequitable access to harm reduction services to create particular overdose risks for women in the included studies (Ataia et al., 2020; Boyd et al., 2018; Fairbairn et al., 2010; McNeil et al., 2014). Experiences of gender-specific trauma, intimate partner violence, and participation in survival sex work increased drug poisoning hazards for street-involved women who use drugs (Ataia et al., 2020; Boyd et al., 2018). Further, policies prohibiting assisted injections at SIFs limited women’s access to overdose-preventive services (Boyd et al., 2018; Fairbairn et al., 2010; McNeil et al., 2014). Addressing the unique drug poisoning risks experienced by women required adopting an intersectional risk environment framework, which acknowledges the ways colonialism, poverty, and criminalization have disproportionately amplified risks, particularly for Indigenous and transgender women (Boyd et al., 2018). Gendered and racialized SEM in drug poisoning operated through social, psychological and environmental pathways. We have moderate confidence in this review finding.

Gendered and racialized substance use contexts. Traumatic experiences, gendered violence, insecure housing situations and engagement in survival sex led street-involved women to engage in unsafe drug consumption practices as a coping mechanism (Ataia et al., 2020; Boyd et al., 2018). As Boyd et al. (2018) described, poverty, exposure to violence, and opioid poisoning were often intersecting risks for marginalized Indigenous, racialized and trans women in Vancouver, Canada (p. 113):

Alongside opportunistic predatory physical and sexual violence, participants commonly described ways in which some men preyed upon women who were experiencing an overdose or had lost consciousness [...] with Indigenous and transgender women reporting an even greater degree of marginalization.

Additionally, racialized women were often impacted by drug criminalization and incarceration, and experienced drug poisoning after being released from jail (Ataia et al., 2020). Therefore, feminization and racialization of poverty were described as additional social mechanisms impacting PWUD operating within a social pathway that also intersected with other dimensions of inequity to produce a gender-specific risk of drug poisoning.

Although most of the articles that discussed gender focused on unique overdose risks or harms for women who use drugs, there was also recognition of the way—especially in rural and suburban communities—deindustrialization and economic downturns in “blue collar towns” (described in Finding 1 above) fueled hopelessness and drug use for young men. As Sered (2019) explained (p.49), “Although occupational injuries and subsequent use of pain medication made pills accessible, Weymouth residents more often related the current opioid crisis to the “lack of hope for decent [blue collar] jobs,” especially for young men.” Included studies connected these trends to loss of social capital within the community

² Overdose Good Samaritan laws are policies that exist in some (but not all) states within the United States and nationally in Canada that provide legal protections for individuals who call for emergency assistance in the event of a drug overdose. This may include protection from arrest and/or prosecution for crimes related to drug possession, drug paraphernalia possession, and other crimes.

and increased stigma that led to hopelessness and overdose risk for men specifically, through a psychological pathway.

Gendered dynamics in harm reduction service use. The practice of assisted injections described in included papers illustrated how cultural gender norms and financial deprivation intersected to create barriers for women in accessing harm reduction services, and thus affected their overdose risk. Women often experienced more physical barriers to injecting and had less experience injecting, which, combined with dynamics around intimacy, trust and gendered norms led to women often receiving assisted injection from partners. Women often relied on ‘doctors’ or ‘boyfriends’ for assisted injections, who “ultimately determined when, how, and with whom they injected” (McNeil et al., 2014). Rules prohibiting the practice of assisted injection at SIFs created barriers to harm reduction services that disproportionately impacted the most socioeconomically marginalized women (Fairbairn et al., 2010; McNeil et al., 2014). In this context, women didn’t access SIFs and instead relied on exploitive relationships for assisted injections, often in public places, a mechanism that added vulnerability in the risk environment and increased drug poisoning risk (as previously identified). The inability to access a life-saving harm reduction service heightened the risk of drug poisoning for socioeconomically marginalized women who use drugs through a social pathway.

Low threshold overdose prevention sites (OPs) allowing assisted injections facilitated increased access to harm reduction resources and fostered feelings of safety; however, dimensions of marginalization continued to harm women within these spaces (Boyd et al., 2018; McNeil et al., 2014). Boyd et al. (2018) noted that OPs remained perceived as “‘masculine spaces’ that can jeopardize women’s access” (Boyd et al., 2018) and have placed some women at risk of violence and harassment, leading them to avoid accessing these services (Boyd et al., 2018). Included papers highlighted the need for women-only spaces, and culturally attentive alternatives for Indigenous women and other women of color to address gendered, racialized, and socioeconomic barriers to service access (Boyd et al., 2018) that exacerbate overdose risk via an environmental pathway.

Pathways linking SEM and overdose

As illustrated in Fig. 2 and described in Table 3, our narrative synthesis’ four key findings suggest that SEM is linked to drug poisoning across five overarching material, behavioral, psychological, social, and environmental pathways, each of which is comprised of different mechanisms identified by our included studies. The reciprocal connection between drug poisoning and SEM is reinforced via institutional pathways, and as identified throughout our results, there is interaction within and between each of the pathways. These emergent pathways categorize the underlying empirical mechanisms through which SEM and poisoning are connected, creating a new theoretical typology to understand SEM and drug poisoning risk.

Pathway ‘A’ describes a material pathway where the denial or restriction of resources like housing, employment, labor market exclusion, income inadequacy, and access to services increases drug poisoning risk (Krebs et al., 2016; Lanier et al., 2012; Otterstatter et al., 2016; Richardson et al., 2021; Rintoul et al., 2011; Xiang et al., 2012; Zlotorzynska et al., 2014). In this pathway, PWUD are at increased overdose risk via mechanisms of having fewer material resources; precarious income generation strategies leading to forced trade-offs that prioritize material concerns over using drugs safely; and housing- or income-induced barriers to harm reduction services or supplies. Through a behavioral pathway (Pathway ‘B’), the stress of marginalization alters behavior, prioritizing incentivizing short-term rewards necessitated by social and material conditions; (Gee et al., 2007; Harrell et al., 2003; Siahpush et al., 2006) in this case, participation in more risky substance use behaviors. Pathway ‘B’ is a behavioral pathway with mechanisms whereby opioids are used as a homelessness survival technique for phys-

ical comfort; and the realities of being socioeconomically marginalized increase exposures to circumstances where cues for higher risk substance use practices are stronger. Further, SEM may be affecting health outcomes through psychological pathways (Pathway ‘C’) where deprivation and the experience of associated psychological distress, anxiety, and depression heightens risk (Dasgupta et al., 2018). The mechanisms linking SEM to overdose through psychological pathways involve opioid use as a coping mechanism for alleviating the distress associated with SEM, and economic hardship, creating apathy toward the consequences of opioid use, including overdose. Marginalization also affects drug poisoning risk via social pathways (Pathway ‘D’), for example, through interpersonal conflict, (Marmot, 2006) social networks, and socially prescribed roles that can all heighten risk (Fadanelli et al., 2020; Latkin et al., 2019). Pathway ‘D’ operates through mechanisms of social networks in group housing that influence levels of substance use; socially prescribed gender norms where men assist women with injection; and male-dominated harm reduction spaces that heighten the risk for women; all exacerbated by the feminization and racialization of poverty. Finally, Pathway ‘E’ is an environmental pathway that describes physical, structural, or contextual conditions and settings where the risk of overdose is heightened because of SEM. The environmental pathway is comprised of mechanisms, such as deindustrialization and abandoned buildings providing physical spaces to use drugs; concentrated neighborhood drug use and availability; and policies in housing environments that lead to hidden or risky use, among others.

The arrows labeled ‘F’ in the model indicates the presence of interactions between mechanisms from *different* pathways that are possible, for example, high rates of unemployment (Pathway ‘A’) combined with widespread drug use and availability (Pathway ‘E’) can intersect to increase drug poisoning risk, again highlighting the accumulation of advantage and disadvantage that is present within this ecosystem. Several articles also described interactions between mechanisms within a *single* pathway, such as precarious income generation leading to more risk exposure and simultaneously limiting access to harm reduction supplies.

In addition, this review also identified an institutional pathway that reinforces marginalization through the criminalization of substance use (Pathway ‘G’) whose associated mechanisms demonstrate how experiencing overdose can also lead to SEM. These reinforcement mechanisms underscore the explicit consideration of cumulative advantages and disadvantages we adopted in this review. Via policies that exclude PWUD from housing, employment, and social assistance as well as increased surveillance and police presence in marginalized communities, there can be an intensification of risk due to the criminalization of substance use itself wherein overdose may reinforce SEM.

Discussion

Summary of conceptual and empirical synthesis

Our review identified four main substantive findings connecting SEM to overdose (summarized in Table 2). A typology for organizing the mechanisms and pathways present in the qualitative literature on SEM and overdose emerged consisting of material, behavioral, psychological, social, and environmental pathways, with multiple mechanisms connecting SEM to overdose (depicted in Fig. 2 and described in Table 3). Interrelationships are present in mechanisms both within and between pathways and relationships are reinforced through institutions involved in the criminalization of substance use.

Connectedness between mechanisms

This narrative synthesis identified the significance of deeply interconnected and layered mechanisms. For example, this review adds con-

siderations of SEM to the often-cited connection between criminal legal system involvement and overdose. Several studies found a connection between recent release from prison and overdose, and noted the increased vulnerability to overdose due to decreased opioid tolerance. However, the papers in our review add insight on how socioeconomic mechanisms are implicated in these processes, affecting and being affected by this relationship. For example, those recently released often experience acute social and economic marginalization post-release, including poverty and unemployment, which both contribute to increased substance use and overdose due to a lack of material resources and opportunities. This research synthesis identifies how those who are formerly incarcerated and experiencing SEM may be especially wary of police interactions and legal consequences and, as a result, may adopt less-safe injecting practices to avoid them. Part of the SEM experienced by this group is housing insecurity following release, which contributes to overdose by creating higher-risk substance use environments. Feelings of hopelessness about the future due to limited prospects post-release can contribute to ambivalence toward drug poisoning risk. Finally, being formerly incarcerated is a status that carries stigma and the social exclusion and “othering” felt by those who have been released from prison may bring emotional or psychological pain: experiences which are intensified by economic marginalization and exacerbate overdose risk.

Another novel contribution of this review is the important identification of how experiences of overdose may reinforce SEM, and this carries essential considerations for how to respond to the longer-term impacts of overdose, beyond just overdose prevention. In the above example, when someone who has been recently released experiences or witnesses overdose, contacting emergency services can increase the likelihood of subsequent criminalization or incarceration. This likelihood is higher for those living in poverty, as drug use and overdose itself is more highly surveilled and therefore criminalized in low-income neighborhoods (Fadaneli et al., 2020; Latkin et al., 2019), which then reinforces the pathways and mechanisms described above. This example highlights the confluence of the conditions and dimensions of risk involved in SEM and illustrates concepts present in the theoretical frameworks used to guide this study, namely, 1) the cumulative disadvantage that is present when people experience marginalization from multiple institutions and experiences over time (Dannefer, 2003) including the criminal legal system, law enforcement and emergency responders, employers, and housing organizations; and 2) the production of risk that results from interactions between individuals and their environments, including shelters, harm reduction spaces, and even neighborhoods (Rhodes, 2002, 2009). Critically, though, this example says little about the situated nature of risk in relation to social location and processes operating across social-structural dimensions. This is because most included studies did not specify the ways processes and relations are embodied, reflected, and situated with respect to social location to shape overdose risk, limiting our ability to synthesize and extrapolate findings about the way mechanisms interact within specific social, historical, and geographic contexts to produce variegated effects of SEM on overdose on the basis of social locations (e.g. gender, sexuality, ability) (Collins et al., 2019; Crenshaw, 2017).

Intersectional considerations

As other scholars have argued, the many social factors associated with overdose cannot be thought of simply as predictors or consequences but rather should be understood as circumstances that are inextricably intertwined with patterns of drug use that then shape the health, including drug poisoning outcomes (Galea & Vlahov, 2002). An intersectional framework can be used to demonstrate how aspects of privilege or experiences of oppression related to social location can interact to produce unique configurations of drug poisoning risk that are greater than the sum of their individual components (Crenshaw, 2017). Understood with a cumulative advantage and disadvantage lens, then, we expect experi-

ences of overdose risk to operate in highly situated and highly interconnected ways as social locations converge within the risk environment to produce or mitigate drug-related outcomes, and these experiences compound over time and across generations. These conceptual perspectives offer a rich analytic lens when taken together, one through which inequities in drug-related harm across historical time can be better understood.

However, as mentioned, intersectional framing and perspectives aimed at analyzing or explaining the causes of such inequities were rarely integrated into included studies in a meaningful way (excepting (Boyd et al., 2018)), and included studies often relied on samples that had limited gender or racial/ethnic diversity. Only one study included transwomen, and otherwise, included studies did not examine overdose risk for gender diverse populations. Several of the included articles did, however, acknowledge that experiences with overdose risk take place within existing systems and structures of power (e.g., policies, institutions) in a way consistent with the concept of intersectionality (Crenshaw, 2017). Additionally, some papers recognized the intersecting social locations of participants, such as disability, gender, and race, despite lacking an explicit intersectional framing (Collins et al., 2019; Jozaghi, 2012; Kennedy et al., 2019).

To fully consider situated risk that is impacted by social locations and temporal considerations, future work in this area must include deliberate attention to the unique challenges of racial/ethnic minorities with opioid use disorder (Jordan et al., 2021), and to the ways in which social identities intersect and interact. The COVID-19 pandemic has disproportionately worsened overdose mortality outcomes for racial/ethnic minoritized communities (Friedman & Hansen, 2022) (Jordan et al., 2021) and incorporating a race equity framework (Jordan et al., 2021) with intersectional considerations is needed.

Future directions

Structural change. Moore (2004) and Wallace et al. (2018) contend that effective overdose response must address structural issues of poverty, criminalization, and homelessness: claims consistent with findings from included papers. For instance, Small et al. (2007) argue that increasing access to affordable housing is needed to address harms related to public injection, while others call for reducing marginalization through access to employment and mental health services (Bennett et al., 2017; Mateu-Gelabert et al., 2017; McLean, 2016). Many of the included studies also articulate the need to change the legal structure of drug criminalization, as legal barriers and prohibitionist frameworks cause harm and limit the effectiveness interventions (Holloway et al., 2018; McNeil et al., 2014; Wright et al., 2005), and indeed, some progress toward decriminalizing drug possession has been made in some of the study jurisdictions. For example, in British Columbia, Canada, adults have not been subject to criminal charges for the personal possession of small amounts of certain illegal drugs since January 31, 2023 under an exemption from the Controlled Drug and Substances Act (Government of British Columbia, 2022).

Future policy-relevant research in this area would be strengthened by attending to structural factors like the intersections of racial capitalism with hierarchies of material insecurity (Taiwo et al., 2021), and the implications of the carceral system for racial justice outcomes. Further, gendered morbidity and mortality statistics indicate a heightened risk of overdose for people who identify as men and as transgender (BC Coroners Service, 2020), while most of the gender-related qualitative research reviewed centered on mechanisms that shaped risk for women. Because substance use disorder is more common for men, it is possible that SEM does not intersect with overdose risk in the same ways for women and transwomen as it does for men and transmen. With fewer other people of the same gender experiencing the same challenges, women and transwomen may have more extreme or more isolated experiences when they do have SEM that intersects with using drugs. For example, women and transwomen may have more severe sub-

stance use disorder on average relative to men, may be more reluctant to seek treatment, and may find that when they do interact with services, those services have been designed primarily to meet the needs of men (Foster et al., 2016; Greenfield et al., 2007; Hernandez-Avila et al., 2004; Holzhauer et al., 2020). Future research, therefore should attend to the mechanisms and pathways that shape SEM and overdose risk for people of all genders, including men and those who identify as non-binary or gender fluid, and seek to understand how gender as a social construct intersects with other marker of identity within social structures to shape overdose risk.

Additional research is needed to test how mechanisms and pathways operate at varying social and ecological levels (individual, interpersonal, community, society) in the opioid crisis (Jalali et al., 2020). Future applications of our created typology should also be applied to research that has a wider geographic and demographic reach than the included studies, in a way that centers racial and gender-based equity.

Addressing the risk environment. Decontextualized harm reduction approaches that focus solely on individual behavioural change can be ineffective or even harmful without considering the structural barriers and social processes involved (Boyd et al., 2018; Kerr et al., 2013; McLean, 2016; McNeil et al., 2014; Moore, 2004; Small et al., 2007). Thus, while increasing the availability of harm reduction services is necessary to reduce rates of overdoses, expansion of services alone is not sufficient without considering social processes and addressing the structural barriers which constrain access to services among socioeconomically marginalized populations. Extending a risk environment approach (Rhodes, 2002; Rhodes, 2009) into policy making (Moore, 2004; Wallace et al., 2018) is a key way to be responsive to the SEM and drug poisoning relationships identified in this synthesis. A harm reduction approach responsive to SEM will appear different across different contexts because the risk environments and needs vary across populations and places. Boyd et al. (2018) highlight the need for women-only and Indigenous-led overdose interventions to address gendered and racialized barriers in accessing SIFs. Similarly, Bennett et al. (2017) discuss the need for targeted overdose interventions for veterans. Peer-based approaches to harm reduction (i.e., approaches that include people with past or present drug use experience who use that lived experience to inform their professional work) may be particularly effective in reducing overdose risk, mainly because of peers' ability to relate and empathize with the experiences of PWUD, build trust, and foster safety and belonging, disrupting the social pathway between SEM and drug poisoning (Boyd et al., 2018; Kennedy et al., 2019; McNeil et al., 2014).

Researcher positionality

Our respective social locations and life experiences may impact how we approach this research, the assumptions we bring to this work, and the conclusions we draw. We attended to this by discussing our identities and experiences that intersect with our research question. No research team members identified as having lived experience of overdose or deep poverty. However, some of us have lost friends, family members, and co-workers to overdose and lived in neighborhoods with entrenched drug use and SEM. Through reflexive discussion, we surfaced the privilege we feel with the distance we can create between our lives and the realities of the topics we are researching, and we note that there is a risk that this distance could translate to an intellectualizing of the real, human experiences contained in the papers we reviewed.

We believe that SEM is harmful for PWUD, and we discussed the possibility of us unconsciously favoring results that support those beliefs. To address the potential bias from these perspectives, we re-read our near-final presentation of results alongside our extraction of findings to look for instances of over-intellectualization of the findings. We also re-examined our results for findings that we may have overlooked and paid attention to the possibility of over-prioritizing findings in the "expected" direction. Although we did not find any undue prioritiza-

tion of results, this process did result in the addition of more quotes and examples from the included studies to humanize the mechanisms and pathways included in the typology.

Limitations

Some cross-cutting limitations were found in several included studies where researchers did not clarify their positionality or examine the way their social locations may influence the study. This limits our ability to assess bias in the body of research and to understand the potential for researcher influence on study findings. In addition, many of the included studies had participants who were predominantly white men. This lack of diversity gives rise to relevance concerns and presents the risk that the review findings may misrepresent the issues experienced by those who are racialized, and who are women or transgender/two-spirit. Overlooking an explicit articulation of the intersectional experiences of SEM for overdose risks, as was the case in many of the included papers, may serve to eclipse or erase individual and group identities and social locations (Grace, 2012; Young & Meyer, 2005) without an understanding of how these may interact or be co-constituted (Hankivsky & Christoffersen, 2008). Efforts were taken to remove all duplicate findings from our dataset. Of note, both the Wright et al. (2005) and the Wright et al. (2006) papers used data from the same sample of 27 participants who had either past or current experience with heroin use and homelessness, and similarly with the McLean (2016) and McLean (2018) papers. We examined both papers carefully in each case and decided to include both, as they presented different analyses and findings. Most included studies were conducted with overdose survivors and did not specify whether their findings were specific to fatal or non-fatal overdose. This represents a limitation in the ability to understand whether differences in mechanisms exist for fatal vs. non-fatal overdose and offers an opportunity for future research.

Further, although we chose studies conducted in geographical locations that have similar policy contexts, we do not necessarily know whether experiences of similar elements of SEM are analogous between or within countries. An example of this is the Overdose Good Samaritan Laws, or the limitations on social program participation (e.g., receipt of Section 8 housing) after criminal legal system involvement, which exist in similar forms in some (but not all) of the geographical contexts of included studies. Even in areas where the laws are the same, they may not be enforced in the same way, and the effects of policing produced at the intersection of various SEM factors may also not be experienced in comparable ways in all contexts. Thus, while we have produced a preliminary understanding of the mechanisms and pathways through which SEM and overdose are related, these findings should not be assumed to be applicable to all included regions in the same way and more contextualized evidence is needed to make comparisons across contexts possible.

Conclusions

Socioeconomic marginalization is deeply connected to overdose risk. In this narrative synthesis, four key findings derived from the existing published qualitative literature speak to how resource insufficiency and labor market exclusion, homelessness and housing, policing and emergency response, and gendered/racialized intersections of inequity all shape overdose risk. These findings can be understood through material, behavioral, psychological, social, and environmental pathways that contain multiple mechanisms connecting SEM to overdose. Critically, the interconnectedness of these mechanisms can lead to intensification of overdose as well as reinforcement of SEM itself. Policies that consider the role of upstream social and economic determinants, as well as the complexity of socioeconomically-related mechanisms that shape overdose risks are urgently needed.

Declarations of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics approval

The authors declare that the work reported herein did not require ethics approval because it did not involve animal or human participation.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.drugpo.2023.103971.

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