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Intersection of adverse childhood experiences, suicide and overdose prevention

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Abstract

Adverse childhood experiences (ACEs), suicide and overdose are linked across the life course and across generations and share common individual-, interpersonal-, community- and societal-level risk factors. The purpose of this review is to summarise the shared aetiology of these public health issues, synthesise evidence regarding potential community- and societal-level prevention strategies and discuss future research and practice directions.

Growing evidence shows the potential for community- and societal-level programmes and policies, including higher minimum wage; expanded Medicaid eligibility; increased earned income tax credits, child tax credits and temporary assistance for needy families benefits; Paid Family Leave; greater availability of affordable housing and rental assistance; and increased participation in the Supplemental Nutrition Assistance Program (SNAP), to contribute to ACEs, suicide and overdose prevention. Considerations for future prevention efforts include (1) expanding the evidence base through rigorous research and evaluation; (2) assessing the implications of prevention strategies for equity; (3) incorporating a relational health perspective; (4) enhancing community capacity to implement, scale and sustain evidenced-informed prevention strategies; and (5) acknowledging that community- and societal-level prevention strategies are longer-term strategies.

INTRODUCTION

Adverse childhood experiences (ACEs), suicide and overdose are clear and pressing public health issues in the USA and are designated strategic priorities for the National Center

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for Injury Prevention and Control at the Centers for Disease Control and Prevention. The purpose of this analytic essay is to summarise the shared aetiology of ACEs, suicide and overdose; synthesise existing evidence regarding potential community- and societal-level prevention strategies; and discuss future research and practice directions. The goal is to inform an intersectional framework and an upstream public health approach to comprehensive prevention.

Public health burden of ACEs, suicide and overdose

ACEs are potentially traumatic events that occur during childhood (ages 0–17 years), such as experiencing abuse or neglect, witnessing intimate partner violence (IPV), having a family member attempt or die by suicide or living in a household where a parent or caregiver is negatively affected by substance use or an ongoing mental health condition.[1] National data show that more than 60% of US adults report at least one ACE, and nearly half report multiple ACEs.[2] In addition to immediate impacts on child safety and well-being, ACEs are associated with an increased risk of poor health, social and economic outcomes across the life course, such as anxiety, depression, substance use disorders (SUDs), suicide attempts, lower education and unemployment.[3-5]

Between 2000 and 2022, the rate of suicide death increased by 36%.[6] In 2022 alone, more than 49 000 people died by suicide, and suicide was the second leading cause of death for people ages 10–14 and 25–34 years and third leading cause of death for people ages 15–24 years.[6 7] While the rate of suicide death is highest among American Indian/Alaska Native (AI/AN) and non-Hispanic White individuals, the rate has increased substantially among Hispanic and non-Hispanic Black individuals in recent years.[8] Moreover, for each suicide death, an estimated 265 people seriously consider suicide and 38 attempt suicide.[9]

In 2022, nearly 108 000 people died of a drug overdose, the highest annual number ever recorded.[6 10] In 2022, the rate of overdose death was highest among AI/AN individuals followed by non-Hispanic Black and non-Hispanic White individuals.[6 10] From 2019 to 2022, the number of overdose deaths increased by more than 50%, with opioids, primarily synthetic opioids other than methadone (eg, illegally made fentanyl), driving this rapid increase.[6 10] Recent estimates also show that more than 48 million people, or 17% of people aged ≥12 years, had an SUD, and one in four used illicit drugs in the past year.[11]

Links between ACEs, suicide and overdose across the life course and across generations

ACEs, suicide and overdose are intricately linked across the life course and across generations.[12] For example, having a family member attempt or die by suicide, a family member experiencing negative impacts of an SUD or a mental health condition or a family member die by overdose are ACEs.[1] Exposure to these and other ACEs can result in a toxic stress response, which is defined as severe or prolonged activation of the body's stress response system.[13] Severe or prolonged activation of the body's stress response system can disrupt multipe biological systems and influence the adoption of various coping behaviours.[13] These biological and behavioural changes have the potential to contribute to the later development of suicidal thoughts and behaviours and initiation of substance use.[14 15] Thus, suicidal thoughts and behaviours and SUDs among adults can function as ACEs

for the next generation, and exposure to these and other ACEs can increase the risk of later suicidal thoughts and behaviours and SUDs (figure 1).

Existing evidence also shows bidirectional associations between suicidal thoughts and behaviours and SUDs. Several studies indicate that suicidal thoughts and suicide attempts can predict the later development of an SUD,[16 17] with substance use potentially functioning as a coping mechanism for suicidal thoughts. Conversely, substance use is a known risk factor for suicide. Existing studies suggest that SUDs may predict later suicidal thoughts, suicide attempts and death by suicide, with co-occurring mental health conditions potentially serving as key contributing or mediating factors.[18 19]

Shared aetiology of ACEs, suicide and overdose

There are multiple factors at each level of the socioecological model that can increase risk for ACEs, suicide and overdose.[20 21] Figure 2 provides examples of shared risk factors for all three of these public health issues, including unemployment and mental health conditions at the individual level; social isolation and household economic stress at the interpersonal level; concentrated disadvantage and experiences of discrimination at the community level; and income inequality and stigma associated with mental healthcare and SUD treatment at the societal level.[20-23] Importantly, in the socioecological model, individual- and interpersonal-level risk factors occur within a broader social and structural context that is influenced by factors at the community and societal levels. Thus, risk factors at the community and societal levels can create contexts that either mitigate or exacerbate individual- and interpersonal-level risk factors, and factors across all levels often interact to affect the risk for ACEs, suicide and overdose. Figure 3 provides an example of the pathways by which one factor at the community level, concentrated disadvantage, may affect the risk for ACEs, suicide and overdose. In figure 3, concentrated disadvantage, broadly defined as a high percentage of socially or economically marginalised residents in an area, is associated with limited healthcare access, educational and employment opportunities and affordable housing, exposure to community crime and violence and high residential mobility.[24] These factors can then contribute to increased poverty and material hardships, feelings of stress and anxiety, suicidal thoughts and suicide attempts and SUDs among families and caregivers, all of which can increase the risk for ACEs, suicide and overdose.[20-23] Indeed, existing evidence shows that concentrated disadvantage is associated with higher rates of suicide and overdose deaths and an increased risk of multiple ACEs.[25-32]

Risk factors for ACEs, suicide and overdose are not equally distributed. Specifically, structural racism contributes to and is reflected in a disproportionate burden of many shared risk factors, such as involvement with the criminal-legal system, economic stress and material hardships and lack of access to mental healthcare and SUD treatment, among AI/AN, Hispanic and non- Hispanic Black communities.[33] While rates of suicide and overdose deaths have historically been higher among non-Hispanic White individuals, in recent years, there have been sharp increases in rates among non-Hispanic Black, Hispanic and AI/AN individuals.[8 34 35] Moreover, longstanding inequities in the distribution of many of these risk factors, including unemployment and poverty, were exacerbated by

the COVID-19 pandemic.[36] Thus, an equity-centred approach to understanding shared risk factors and identifying and implementing tailored and culturally appropriate strategies, particularly those that address social determinants of health, is critical to effective prevention.

Prevention intersection of ACEs, suicide and overdose

The number and range of shared risk factors for ACEs, suicide and overdose at all levels of the socioecological model highlight the potential for prevention strategies focused on shared risk factors to simultaneously reduce the public health burden of all three. To date, prevention efforts for ACEs, suicide and overdose have primarily focused on risk factors at the individual and interpersonal levels. As shown in figure 2, existing evidence-based and evidence-informed strategies that address individual- and interpersonal-level risk factors include caregiver and child programmes such as Strengthening Families and the Incredible Years and school-based programmes such as the Good Behaviour Game.[1 37 38] These programmes often focus on developing child and youth social, emotional and behavioural skills and fostering strong caregiver-child bonds.[1 37 38] While these individual- and interpersonal-level strategies are vital components of comprehensive prevention efforts, they are typically time and resource intensive, and scalability and sustainability can be challenging. Further, as depicted in figure 2, although these strategies may be effective in addressing individual- and interpersonal-level risk factors, they do not address community- and societal-level factors that also contribute to risk for ACEs, suicide and overdose. Thus, individual- and interpersonal-level prevention strategies alone are likely not sufficient to achieve sustained population-level reductions or to reduce existing racial and ethnic inequities in ACEs, suicide and overdose. The magnitude of these issues requires a comprehensive approach, including the integration of individual- and interpersonal-level strategies with community- and societal-level strategies that create social and structural contexts supportive of health and well-being.

Existing evidence[39-87] demonstrates the potential for community- and societal-level programmes and policies to contribute to the prevention of ACEs, suicide and overdose. As shown in figure 2, these programmes and policies include higher minimum wage; expanded Medicaid eligibility; increased earned income tax credits (EITC), child tax credits (CTC) and temporary assistance for needy families (TANF) benefits; Paid Family Leave; greater availability of affordable housing and rental assistance; and increased participation in the Supplemental Nutrition Assistance Program (SNAP).[39-87] These programmes and policies largely focus on improving economic and material conditions or on expanding health insurance coverage and access to healthcare. In doing so, they directly or indirectly address several shared risk factors for ACEs, suicide and overdose across all levels of the socioecological model and could potentially amplify any impacts of concurrent individual- and interpersonal-level strategies. Figure 4 provides an example of the pathways by which a societal-level prevention strategy, Medicaid expansion, may contribute to reductions in ACEs, suicide and overdose. In this example, by facilitating access to healthcare and reducing healthcare-related costs[56 79] (through increased health insurance coverage and enforcement of parity for behavioural health conditions), Medicaid expansion may contribute to decreases in poverty and economic stress, suicidal thoughts and suicide

attempts and potentially risky substance use behaviours,[20-23] decreasing the overall risk for ACEs, suicide and overdose. Below we detail some existing evidence regarding the potential for several community- and societal-level strategies to prevent ACEs, suicide and overdose.

Higher minimum wage.—Increases in state minimum wage can directly address household economic stress and poverty, shared risk factors for ACEs, suicide and overdose. One study found that a $1 increase in state minimum wage was associated with 93 fewer overall reports investigated by child protective services (CPS) for suspected abuse and neglect, with larger decreases observed for reports among younger children.[80] Similarly, a second study found that a $1 increase in state minimum wage was associated with a small decrease in caregiver self-reported child neglect.[39] Additional research showed that a 10% increase in state minimum wage was associated with a decrease in the likelihood of experiencing extreme distress and in the number of bad mental health days among low-income adults aged 25–54 years with lower education, a population likely to benefit from this policy change.[40] Three studies also documented an association of increasing state minimum wage with reductions in rates of suicide deaths.[41-43] In one study, a $1 increase in the state minimum wage was associated with a 3.5% decrease in the rate of suicide death among US adults aged 18–64 years with lower educational levels.[41] Another showed similar reductions in rates of suicide death among men, women and non-Hispanic White individuals, but a smaller reduction in suicide rates among non-Hispanic Black individuals.[42] One study found that increases in state minimum wage were associated with reductions in the combined number of deaths due to drug overdose, alcohol and suicide.[43]

Increased tax credit and temporary assistance for needy families benefits.—Increased state EITC, CTC and TANF benefits may also contribute to the prevention of ACEs, suicide and overdose by directly addressing household economic stress and poverty. Five studies documented decreases in measures of child abuse and neglect, including CPS-investigated reports, foster care entries and hospital admissions for abusive health trauma, in states with higher EITC and CTC benefits.[44-47 51] For example, a 10 percentage point increase in state EITC benefits was associated with 220 fewer total CPS-investigated reports and 241 fewer CPS-investigated reports for neglect per 100 000 children, with the largest decreases observed among young children.[44] Similarly, a $100 increase in maximum TANF cash benefits for a single-parent household was associated with a decrease in mothers' self-report of physically abusive behaviours towards their child among non-Hispanic White and Black mothers.[47] With respect to other ACEs, one study showed that each 10 percentage point increase in state EITC benefits was associated with a 6% reduction in postpartum depressive symptoms among recently pregnant women with lower educational level.[48] Two studies showed that among women with lower educational level, refundable state EITC was associated with a lower likelihood of experiencing IPV,[49] and an additional $1000 in after-tax income due to changes in EITC policy was associated with decreases in experiences of physical and sexual violence.[50] In three studies, a 10 percentage-point increase in the amount of state refundable EITC was associated with a reduction in suicide attempts and suicide deaths.[43 52 53] Lastly, one study found that increases in state EITC benefits were associated with reductions in the combined number of deaths due to drug overdose, alcohol and suicide.[43]

Expanded Medicaid eligibility.—Recent studies have assessed the association of state Medicaid expansion under the Patient Protection and Affordable Care Act (ACA) with ACEs, suicide and overdose. Two studies found that state Medicaid expansion was associated with reductions in CPS-investigated reports for neglect.[54 55] Additional studies found that state Medicaid expansion was associated with decreases in the likelihood of psychological distress among working parents[56] and postpartum depressive symptoms among recently pregnant women.[57] Two studies documented reductions in rates of suicide deaths among adults ages 18–64 years in the context of state Medicaid expansion,[58 59] with one study finding reductions among women, men, non-Hispanic White individuals and those with lower educational level but not among non-White or Hispanic individuals.[58] With respect to overdose, one study showed decreases in rates of all opioid-involved overdose deaths in counties within states that expanded Medicaid.[60] Another found that drug overdose death rates were, on average, lower by 3.7 deaths per 100 000 population per year in states that expanded Medicaid.[61]

Paid Family Leave.—Paid Family Leave policies can help sustain income and reduce stress among new caregivers, thereby contributing to reductions in ACEs. California was one of the first and remains one of the few states to adopt a statewide Paid Family Leave policy. One study found that California's Paid Family Leave policy was associated with five fewer abusive head trauma admissions per 100 000 children ages <1 year.[62] In three additional studies, California's Paid Family Leave policy was associated with reductions in psychological distress and alcohol consumption among caregivers with children ages <2 years,[63] improvements in mental health among employed women with at least one child[64] and decreases in depressive symptoms among women with children ages <1 year, particularly among single women, younger women and non-Hispanic Black and Hispanic women.[65] In one study, Paid Family Leave policies in California and New Jersey were associated with decreases in psychological distress among caregivers with children ages <2 years, with the largest improvements among those who were non-Hispanic White, middle-income, younger and unmarried.[66] Lastly, a study of multiple states found that stronger state-paid family and medical leave were associated with a lower risk of postpartum depression symptoms.[81]

Increased availability of affordable housing and rental assistance.—Existing studies have examined the association of programmes designed to increase housing affordability with ACEs. Two studies found that increased availability of affordable rental housing through the Low-Income Tax Credit Housing programme was associated with reduced rates of CPS-investigated reports for neglect and physical abuse[67] and reduced rates of IPV-related homicides at the state level.[68] Two studies documented lower levels of psychological distress among those receiving rental or housing assistance through US Department of Housing and Urban Development programmes compared with those on the waitlist for assistance.[69 70] Two additional studies evaluated Housing First, transitional housing and rapid rehousing programmes for those who have experienced IPV, finding that these programmes were associated with decreases in physical, emotional, sexual and economic abuse and stalking.[71 72] Notably, existing evidence is mixed regarding the impact

of Housing First programmes on substance use-related outcomes, though several studies show improvments in housing stability.[82 83]

SNAP participation.—Previous studies have examined the association of receipt of food purchasing assistance through SNAP with ACEs. A recent study found that in large, rural neighbourhoods in Connecticut, one additional store accepting SNAP benefits was associated with a 4% decrease in rates of CPS-investigated reports and an 11% decrease in rates of CPS-substantiated reports, with the largest decreases observed for reports for neglect among young children.[73] In five studies, state adoption of policies that expanded eligibility for SNAP, such as eliminating the asset test and increasing the income limit for SNAP eligibility, was associated with reductions in rates of CPS-investigated reports, foster care entries and poor mental health, suicidal ideation, suicide deaths and SUDs among adults.[74 78 84-86] Further studies showed that SNAP participation was associated with decreases in psychological distress[75] and that loss of SNAP benefits was associated with an increased risk of depression among caregivers.[76 77] In addition, one study found that increases in SNAP participation at the state level were associated with decreased suicide rates, particularly among men.[87]

FUTURE DIRECTIONS

Existing evidence suggests that several prevention strategies that focus on addressing shared risk factors[40-88] for ACEs, suicide and overdose at the community and societal levels have the potential for a broad, sustained impact on all three issues.[1 37] Importantly, implementing individual- and interpersonal-level strategies concurrently with broader societal- and community-level strategies in a comprehensive approach likely has the greatest potential to create protective contexts and prevent ACEs, suicide and overdose and may have implications for other public health priorities.[1 37] Key considerations for future intersectional prevention efforts include (1) expanding the evidence base for prevention strategies through rigorous research and evaluation; (2) assessing the implications of prevention strategies for equity; (3) incorporating a relational health perspective; (4) enhancing community capacity and engaging with communities to implement, scale and sustain evidenced-informed prevention strategies; and (5) acknowledging that community- and societal-level prevention strategies are longer-term strategies.

While there is robust and growing evidence for some community- and societal-level prevention strategies, continued research and evaluation are needed to further build and strengthen the evidence base. For some strategies, like Paid Family Leave, there is evidence to support its effectiveness in preventing ACEs, including child abuse and neglect, poor caregiver mental health and caregiver alcohol use,[62-66] but no existing published evidence regarding potential impacts on suicide and overdose. Given that Paid Family Leave can address shared risk factors for ACEs, suicide and overdose,[20-23] it is reasonable to hypothesise that this strategy may be effective in preventing all three. Moreover, given that there is evidence that Paid Family Leave is effective in reducing proximal risk factors for suicidal ideation and SUDs, namely, poor mental health,[62-66] it stands to reason that this strategy may have cascading effects in preventing other ACEs, suicide and overdose.

However, additional rigorous research is needed to assess the potential impacts of several community- and societal-level prevention strategies across all three public health issues.

Critical to continued research and evaluation is assessing whether access to and the potential benefits of prevention strategies are realised for all populations. Inequitable access to prevention strategies or an inequitable distribution of the potential benefits of these strategies may contribute to widening gaps in ACEs, suicide and overdose, specifically by race and ethnicity. For example, while existing research shows that Paid Family Leave policies increase leave-taking among postpartum women of all races and ethnicities, some studies show that increases are smaller among non-Hispanic Black and Hispanic women than among non-Hispanic White women.[88] Racial and ethnic inequities in access to and use of Paid Family Leave persist[89 90] for multiple reasons because part-time and public sector workers are not eligible under some policies and because many policies do not provide full pay or job protection.[91] Because of systematic differences in access to Paid Family Leave, these policies do not have the same health benefits for all racial and ethnic groups.[66] Prioritising access for populations disproportionately affected by shared risk factors for ACEs, suicide and overdose, including non-Hispanic Black, Hispanic and AI/AN populations, in designing and implementing intersectional prevention strategies may help reduce existing inequities. Evaluating the impact of these strategies on outcomes for diverse populations will be important to assessing whether these strategies reduce, or potentially exacerbate, existing inequities.

Incorporating a relational health perspective can help enhance future intersectional prevention and proactively promote health and well-being across generations. Relational health is the capacity to develop and sustain safe, stable and nurturing relationships.[92] Importantly, the capacity to develop and sustain these relationships is fostered within families and broader communities. Given intergenerational links among ACEs, suicide and overdose (figure 1), interventions that mitigate the impact of ACEs on outcomes for caregivers and other adult family members, such as trauma-informed[93 94] mental healthcare and SUD treatment, can help build safe, stable and nurturing relationships within families and prevent ACEs for the next generation. In addition, community- and societal-level strategies that enable widespread, consistent and equitable access to a range of health, social, economic and educational resources and services can help create broader contexts that promote individual and family capacity to develop and sustain safe, stable and nurturing relationships.

Enhancing community capacity to implement, scale and sustain various prevention strategies will also be key to future intersectional prevention. The National Association of County and City Health Officials developed the Suicide, Overdose and Adverse Childhood Experiences Prevention Capacity Assessment Tool for state, local and territorial health departments.[95] The tool identified several key barriers to intersectional prevention, including the lack of sufficient funding and staff, competing priorities such as the COVID-19 pandemic and limited data integration to document burden and evaluate the impact.[95] Many health departments also reported greater availability of resources for overdose prevention than for ACEs or suicide prevention.[95] Notably, some overdose prevention strategies, including those that focus on social and structural conditions such as income inequality and lack

of economic opportunities, address shared risk factors for ACEs, suicide and overdose, underscoring the potential for existing resources to have intersectional impact and the importance of including multiple outcomes in evaluations of overdose prevention strategies. In addition, programmes and policies that increase access to evidence-based SUD treatment, including medications for opioid use disorder, and prevent fatal overdose, such as naloxone distribution,[96] function to prevent ACEs by treating adult SUDs and reducing overdose deaths. Highlighting and documenting intersectional impact may raise awareness of the potential for intentional, coordinated collaboration to contribute to reductions in all three public health issues.

Lastly, while community- and societal-level prevention strategies are critical to achieving sustained, population-level impact, these are longer-term strategies that do not typically yield short-term results. For example, recent research showed reductions in CPS-investigated reports in states that expanded SNAP eligibility, but these reductions were not evident until 2 to 4 years after states first expanded eligibility.[78] Given the time it can take for outcomes generated by community- and societal-level prevention strategies to be realised, it is important that policymakers and public health partners understand that long-term implementation and evaluation may be necessary to document and realise the impact. In addition, while there is a financial cost associated with implementing community- and societal-level prevention strategies, preventing ACEs, suicide and overdose results in substantial cost savings.[97 98]

Conclusion

The longstanding burden of ACEs, suicide and overdose in the USA highlights the critical importance of primary prevention. Community- and societal-level prevention strategies that focus on shared risk and protective factors for ACEs, suicide and overdose have the potential to transform the broader social and structural context shaping risk and to contribute to population-level reductions in all three public health issues. Efforts to disseminate and support widespread, equitable implementation of identified evidence-based prevention strategies at all levels of the socioecological model are important to realising potential impact across outcomes and populations. Continued research is key to measuring benefits and costs, considering implications for equity and assessing features of successful implementation over time and across generations.

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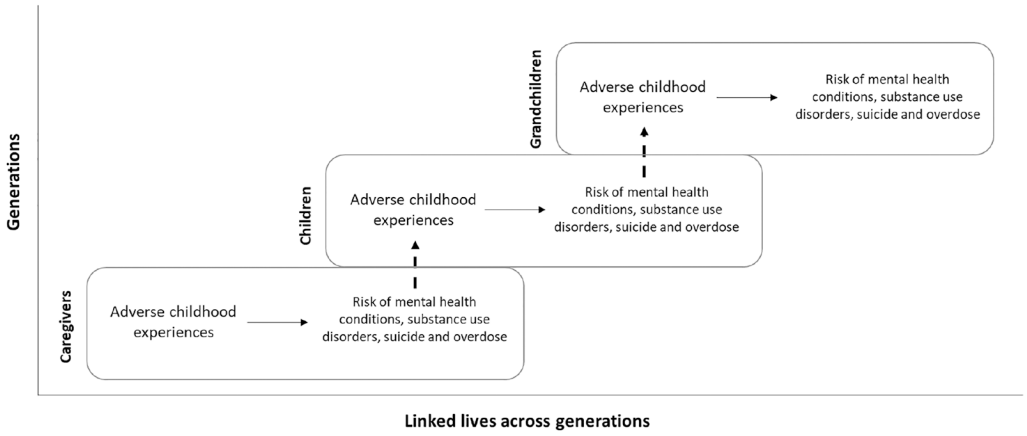

Figure 1.

Intergenerational intersection of adverse childhood experiences, suicide and overdose. Note: Dashed arrows indicate intergenerational links. Prevention of mental health conditions, substance use disorders, and suicide and overdose deaths among those exposed to ACEs functions ACEs prevention for the next generation. See manuscript section titled “Prevention intersection of ACEs, suicide, and overdose” for examples of community- and societal-level prevention efforts. Note: Dashed arrows indicate intergenerational links. Prevention of mental health conditions, SUDs and suicide and overdose deaths among those exposed to ACEs functions ACE prevention for the next generation. See the manuscript section titled ‘Prevention intersection of ACEs, suicide and overdose’ for examples of community- and societal-level prevention efforts.

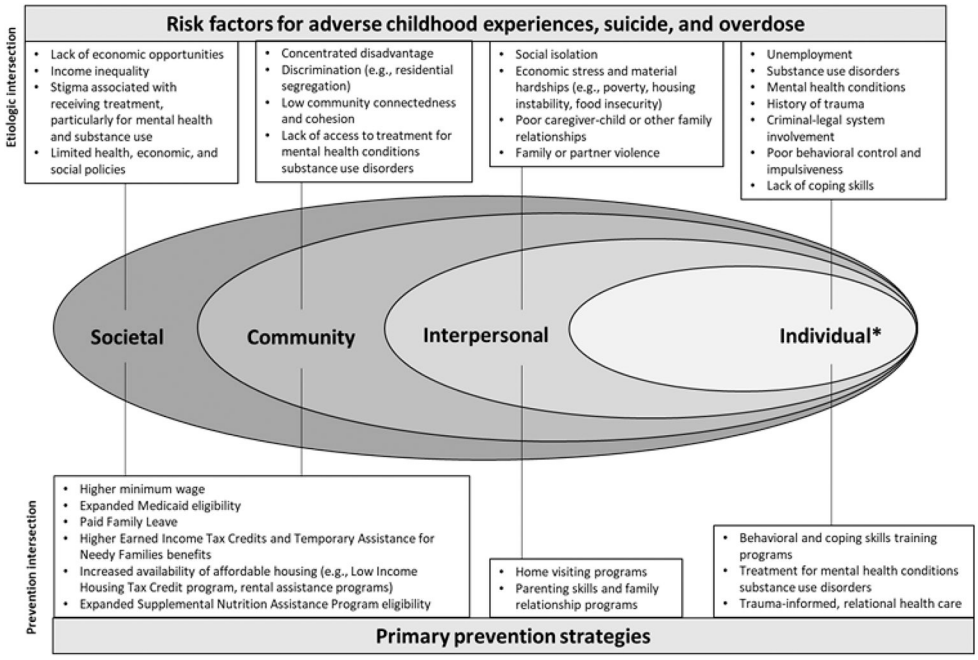

Figure 2.

Etiologic and prevention intersection of adverse childhood experiences (ACEs), suicide, and overdose. *At the individual level, risk factors for ACEs are conceptualised as specific to the child's caregiver(s). Note: This figure is not intended to be a comprehensive list of all shared risk factors and potential prevention strategies for ACEs, suicide and overdose, but rather is intended to illustrate the aetiologic and prevention intersection of these public health issues. See citations 40-88 in the reference list for evidence supporting prevention strategies at the community and societal levels. Adapted from: Decker MR, Wilcox HC, Holliday CN, Webster DW. An integrated public health approach to interpersonal violence and suicide prevention and response. *Public Health Reports*. 2018:65S-79S.

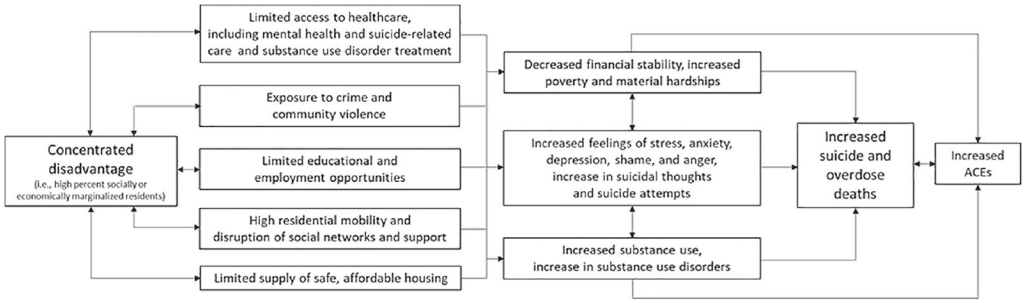

Figure 3.

Example of pathways by which concentrated disadvantage may contribute to the risk for adverse childhood experiences, suicide and overdose.

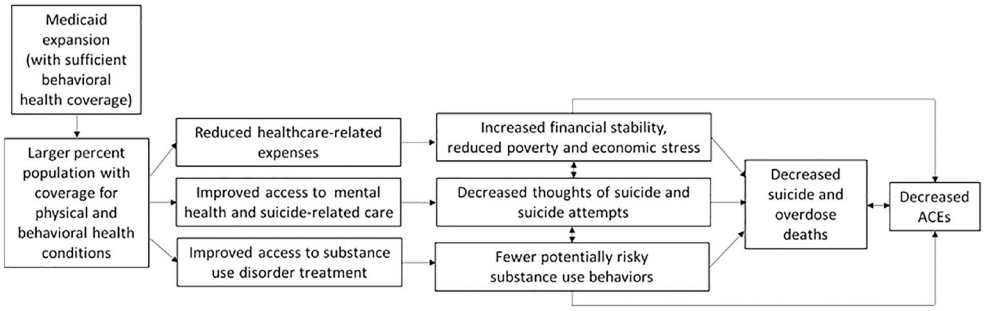

Figure 4.

Example of pathways by which Medicaid expansion may contribute to reductions in adverse childhood experiences, suicide and overdose.