Appendix
Preventing Adverse Childhood Experiences: The Role of Etiological, Evaluation, and Implementation Research
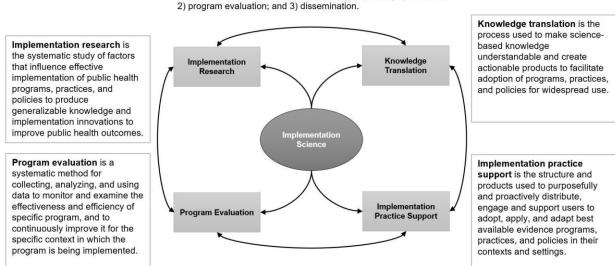Matjasko et al.

Appendix Figure 1. CDC Division of Violence Prevention's implementation science framework.

Implementation science is the creation, adoption, use, support and integration of the best available evidence on programs, practices, and policies in real world settings, including 1) research; 2) program evaluation; and 3) dissemination.

Implementation research is the systematic study of factors that influence effective implementation of public health programs, practices, and policies to produce generalizable knowledge and implementation innovations to improve public health outcomes.

Program evaluation is a systematic method for collecting, analyzing, and using data to monitor and examine the effectiveness and efficiency of specific program, and to continuously improve it for the specific context in which the program is being implemented.

Knowledge translation is the process used to make science-based knowledge understandable and create actionable products to facilitate adoption of programs, practices, and policies for widespread use.

Implementation practice support is the structure and products used to purposefully and proactively distribute, engage and support users to adopt, apply, and adapt best available evidence programs, practices, and policies in their contexts and settings.

Implementation Research

Knowledge Translation

Implementation Science

Program Evaluation

Implementation Practice Support

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Appendix Table 1. Examples of Recent CDC-Supported Etiological Research Findings Focused on Adverse Childhood Experiences (ACEs)

Focus area	Research aims	Findings
Causes	Research to understand the risk and protective factors for ACEs. Includes studies that address research gaps in critical individual, relationship/family, community and societal level risk and protective factors to inform development of novel prevention strategies and approaches. Studies also seek to identify factors that can disrupt intergenerational transmission of ACEs.	Four measures of community environment (SES, parent perceptions of services, perceived social cohesion, and neighborhood alcohol vendor density) were correlated with childhood ACEs, but only alcohol vendor density predicted ACEs. Intergenerational continuity in ACEs was significantly moderated by social cohesion and alcohol vendor density, both community-level factors that could break the cycle of maltreatment across generations.[1]
Characteristics	Qualitative and quantitative research to characterize ACEs, including positive childhood experiences (PCEs), to prevent or mitigate impact. Studies may focus on timing, intensity, duration, and frequency of exposures; and may focus on populations that disproportionately experience ACEs within diverse environments and settings.	Findings from a nationally representative opt-in internet panel survey of 540 parents of children under 5 years indicated 63% of parents spanked their children, and spanking was most frequent among Latino parents (73%) and lowest among White parents (59%). Focus groups stratified by race/ethnicity, gender and population density indicated all parents believed a majority of parents spanked their children and perceptions of frequency and acceptability of spanking were associated with reported use of corporal punishment.[2]
Consequences	Qualitative and quantitative research on the relationship between ACEs and physical and mental health outcomes that occur in later adolescence and adulthood. Research studies may focus on populations that disproportionately experience ACEs and consider key mediators and moderators on the consequences of ACEs.	Examination of relationships among household adversity, transitions and relationship quality during childhood and adult outcomes of income problems, education, and unemployment among a cohort of individuals adults who did and did not report experiencing substantiated child maltreatment. Results showed residential transitions during childhood was negatively associated with education level and caregiver transitions was positively associated with unemployment problems.[3]

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Population attributable fractions for health conditions, health risk behaviors and socioeconomic challenges were estimated by ACEs score from CDC's Behavioral Risk Factor Surveillance System (BRFSS) in 25 states from 2015–2017. Estimated percentage reductions in health conditions associated with preventing all ACEs ranged from 1.7% for obesity to 27.0% for chronic obstructive pulmonary disease. Substantial reductions were estimated for health risk behaviors including current smoking (32.9%) and heavy drinking (23.9%); and reductions in socioeconomic challenges including unemployment (14.9%), having less than a high school education (4.6%) and lack of health insurance (3.8%).[4]

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Appendix Table 2. Examples of Recent CDC-Supported Evaluation and Implementation Research Findings to Inform the Prevention of Adverse Childhood Experiences (ACEs)

Strategy[a]	Approach[a]	Description and research aims[b]	Example study findings
Strengthening economic supports for families	Strengthening household financial security	Description: Policies and programs that allow parents to satisfy their children's basic needs, including food, shelter, and medical care. Research Aims: CDC supported evaluations of economic policies including state earned income tax credits (EITCs), state Medicaid expansions, federal child tax credits, low-income housing tax credits, and other policies as primary prevention strategies for multiple violence outcomes. CDC also supported evaluations of core components of economic policies including EITCs and child tax credits (whether they are refundable) to examine whether they are particularly effective at preventing violence.	• **State EITCs** demonstrate reductions in a range of child adversities including child neglect,[5] serious abusive head trauma,[6] foster care caseloads,[7] and mental distress and poor physical health.[8] • Children with mothers eligible to receive a **partially refundable federal child tax credit** reported fewer childhood injuries and behavior problems.[9] • Integrated **Temporary Assistance for Needy Families (TANF) and child welfare systems** was not associated with second-year increases in substantiated cases of child maltreatment and neglect.[10] • **State Medicaid expansions** were associated with reported reductions in rates of child neglect[11] and reductions in foster care entries during the opioid crisis.[12] • **Mothers' homeownership** was associated with several indicators of their children's economic success 20 years later including home ownership and education level.[13]
	Family-friendly work policies	Description: Policies that allow parents to improve their work-life balance. Family-friendly policies have potential to strengthen economic support, reduce family discord and provide opportunities to empower women and their families.	• California's **paid parental leave policy**, compared to 7 states without the policy, showed a significant decrease in abusive head trauma hospital admissions among children under 2 years of age.[14]

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		Research Aims: CDC investigated 3 mechanisms of change whereby paid parental leave may impact intimate partner violence, which is an ACE.	
Promote social norms that protect against violence and adversity	Public education campaigns	Description: Uses communication strategies, communication channels, and community-based efforts to support parents and their families. Public education campaigns shift social norms and reframe the way people think and discuss ACEs and other childhood adversities. Research Aims: CDC supported several studies to change the narrative regarding violence among children, youth, and the communities where they live.	• Rigorous evaluation of a middle-school social norms marketing campaign, *Your Voice Your Data,* changed perceptions about the acceptability of dating and sexual violence, gender roles, sexual activity and consent, support for victims and bystander intervention.[15] • The Louisville Youth Violence Prevention Research Center evaluated the 3-year social norming media campaign *Pride, Peace and Prevention* to cultivate a positive racial identity, foster community dialogue on racial and social justice issues, and raise critical consciousness to promote racial justice and reduce community rates of youth violence.[16]
	Bystander approaches	Description: Alters the social context and norms of violence and abusive behaviors and promote healthy relationships. Research Aims: CDC supported several evaluations of the Green Dot violence prevention model, and supported evaluations of adapted Green Dot violence prevention models within communities.	• *Green Dot* bystander program was rigorously evaluated in RCTs involving middle and high schools. Results indicate *Green Dot* reduces multiple forms of interpersonal violence at both the school and individual levels.[17] • *Green Dot Community,* an adaptation of Green Dot, was rigorously evaluated to determine improvements in social norms and actions to prevent violence. Intervention engaged youth as well as key community members to address protective factors for violence (collective efficacy,

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			positive prevention social norms, bystander helping), and produced greater collective efficacy and positive social norms specific to helping in situations of SV and IPV over time in the intervention town relative to two control towns.[18]
	Men and boys as allies in prevention	Description: Fosters positive norms regarding gender and masculinity and build healthy norms. Research Aims: CDC supported several studies testing the adaptation and efficacy of prevention programs for adolescent boys and young men.	• *Manhood 2.0,* a program for boys aged 13–19 years that challenges gender norms fostering violence against women and unhealthy sexual relationships, resulted in pre-post reductions in adolescent relationship abuse reports; comparable pre-post reductions were also reported by boys participating in a job-readiness program.[19]
Ensure a strong start for children	Early childhood home visitation	Description: Uses home setting to provide information, caregiver support, and training to families on childcare, health, and development. Effective home visiting models demonstrate many benefits for parents and their young children, including the prevention of ACEs. Research Aims: CDC supported an adaptation of effective home visiting programs to address childhood adversity among mothers.	• *Enhanced First Connections,* an adaptation of home visiting, program that involves short-term perinatal home visits of infants with mothers having a history of adversity or trauma is being evaluated for reductions in child maltreatment (including abuse and neglect), child exposure to IPV and maternal risk factors; and increase family engagement in longer-term home visiting programs, specialized support services and positive parent-child relationships.[20]
Teach prosocial skills	Safe dating and healthy relationship skill programs	Description: Teaches children and youth how to deal with stress, resolve conflicts and manage their emotions and behaviors. Safe dating and relationship skill building programs inform youth on ways to effectively reduce their victimization and	• *Dating Matters®,* a comprehensive teen dating violence prevention model, was implemented in middle schools and resulted in significant reductions in teen dating violence victimization and perpetration, negative conflict resolution

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		perpetration of violence and other adverse outcomes. Research Aims: CDC supported research on the effectiveness of violence prevention programs on multiple adverse outcomes.	skills, and sexual abuse and harassment.[21] *Dating Matters*® also resulted in significant reductions in physical violence, bullying, cyberbullying and other health and delinquency risk behaviors.[22-24]
	Parenting skills and family relationship approaches	Description: Provides parents and caregivers with support and teaches them ways to improve familial relationships. Programs have been shown to reduce risk factors for ACEs and prevent violent behaviors that compromise the health and well-being of children. Research Aim: CDC supported research to understand how effectively evidence-based parenting programs can be delivered online.	• *CDC's **Essentials for Parenting Toddlers and Preschoolers**, an online tool developed for parents of children ages 0 to 5, improved parenting behaviors, attitudes and discipline practices. Parents receiving guided navigation of web content reported greater use of praise, child-directed play, commands and consequences, routines and timeouts and lower use of harsh or permissive discipline than parents who navigated web content on their own.*[25]
Connect youth to caring adults	Mentoring programs	Description: Youth interacting with caring adults and activities fosters healthy interpersonal relationships and life outcomes including growth opportunities, skill development, academic success, and employment outcomes. Research Aim: CDC supported research on the effectiveness of mentoring programs on preventing childhood adversity.	• ***Coaching Boys into Men**, an evidence-based coach-delivered gender violence prevention program, demonstrated reductions in multiple violence outcomes among young men, including dating abuse, SV harassment and sexual assault.*[26]
Intervene to lessen immediate	Programs for Youth with Prior Violence	Description: Identification and treatment of problems (e.g., depression, fear and anxiety, post-traumatic stress disorder,	• School-based *Expect Respect Support Group (ERSG)* program was related to incremental declines in psychological teen

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and long-term harms	Exposure and Trauma	symptoms of distress and problems adjusting to activities of daily living including school and work) that can be risk factors for child adversities and prevent future violence. Research Aims: CDC supports research to evaluate the effectiveness of support groups on preventing childhood adversity among at-risk youth.	dating violence perpetration and victimization, physical victimization, sexual perpetration and victimization, and reactive and proactive aggression among boys; girls demonstrated reductions in reactive and proactive aggression outcomes only.[27]

[a]Source: CDC.[28]
[b]Information on CDC Division of Violence Prevention's funded research investments from 2014 to 2020 are provided online.[20]

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