NCIPC Board of Scientific Counselors
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July 29, 2021

National Center for Injury Prevention and Control
Centers for Disease Control and Prevention
Atlanta, Georgia

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
BOARD OF SCIENTIFIC COUNSELORS (BSC)
Centers for Disease Control and Prevention (CDC)
National Center for Injury Prevention and Control (NCIPC)

Thirty-Seventh Meeting
July 29, 2021

Virtual / Zoom Meeting
Open to the Public

Summary Proceedings

The Thirty-Seventh meeting of the National Center for Injury Prevention and Control (NCIPC; Injury Center) Board of Scientific Counselors (BSC) was convened on Thursday, July 29, 2021 via Zoom and teleconference. The BSC met in open session in accordance with the Privacy Act and the Federal Advisory Committee Act (FACA). NCIPC BSC Co-Chair, Dr. Amy Bonomi, presided.

Call to Order / Roll Call / Meeting Process

Call to Order

Dr. Amy Bonomi, PhD, MPH
Co-Chair, NCIPC BSC
Faculty Affiliate, Harborview Injury Prevention and Research Center, University of Washington, and Founder, Social Justice Associates

Dr. Bonomi officially called to order the Thirty-Seventh meeting of the NCIPC BSC at 10:00 AM Eastern Time (ET) on Thursday, July 29, 2021.

Roll Call / Meeting Process

Mrs. Tonia Lindley
NCIPC Committee Management Specialist
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

Mrs. Lindley conducted a roll call of NCIPC BSC members and *Ex Officio* members, confirming that a quorum was present. Quorum was maintained throughout the meeting. No conflicts of interest (COI) were declared for the open session. An official list of BSC member attendees is appended to the end of this document as Attachment A. Mrs. Lindley introduced Stephanie Wallace, the Writer/Editor from Cambridge Communications and Training Institute (CCTI), who she explained would record the minutes of the meeting. To make it easier for her to capture the comments, Mrs. Lindley requested that everyone state their names prior to any comments for the record. She indicated that the CDC and On Par Production (OPP) Technicians would audio record the meeting for archival purposes to ensure accurate transcripts of the meeting notes. The meeting minutes will become part of the official record and will be posted on the CDC website at www.CDC.gov/injury/bsc/meetings.html. All NCIPC BSC and *Ex Officio* members were requested to send an email to Mrs. Lindley at ncipcbsc@cdc.gov at the conclusion of the

meeting stating that they participated in this meeting. In addition, Mrs. Lindley explained the public comment process.

NCIPC Research Priorities for Addressing Adverse Childhood Events (ACEs)

Overview

Christopher Jones, PharmD, DrPH, MPH
CAPT, US Public Health Service
Acting Director, National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

CAPT Jones thanked Dr. Bonomi for her leadership of the BSC and the members for their thoughtful feedback during the BSC meeting on July 16, 2021 during which they discussed the draft *CDC Guideline for Prescribing Opioids for Chronic Pain.* It certainly was a very rich discussion that took to heart the 2-hour public health session in which they heard directly from the public about the impacts of the guideline. The feedback provided from the BSC during the discussion and on the Opioid Workgroup (OWG) report are going to be instrumental as NCIPC continues to draft a balanced guideline.

For this meeting's discussion, CAPT Jones said he was looking forward to the focus on ACEs research priorities. CDC defines ACEs as preventable, potentially traumatic events that occur in childhood (0-17 years) such as abuse and neglect, experiencing or witnessing violence, and living in a household with a parent who has substance use or mental health challenges. It is known that ACEs are common and have lasting impacts across the lifespan. The latest CDC data estimate that about 61% of all adults have reported experiencing at least one ACE and about 1 in 6 have experienced 4 or more ACEs. It is also known that for many health outcomes, chronic conditions, and health risk behaviors that as the number of ACEs increase, so does risk for health harms. Also known is that the understanding of ACEs has changed over time from the seminal ACEs study between Kaiser and CDC in the 1990s in that conditions such as living in under-resourced or racially segregated, frequently moving, being subjected to homelessness, or experiencing food insecurity can be traumatic for many individuals and exacerbate the effects of other ACEs.

Further, historical and ongoing trauma due to systemic racism and discrimination or the impacts of multigenerational poverty resulting from limited education and economic opportunities also intersect with and contribute to the impacts of ACEs, leading to disproportionate effects in certain populations. This bears out in the data with certain populations such as communities of color, females, and LGBTQ persons (lesbian, gay, bisexual, transgender, queer/questioning) being disproportionately impacted by ACEs. This underscores the critical connection between ACEs and equity. Importantly, there are now decades of research showing that ACEs have been linked to most of the leading causes of death and are strongly linked to issues of mental health and wellbeing, suicide, and overdose. In fact, ACEs impact all of the topics on which the Injury Center focuses. It is also known that there is a prevention power for ACEs to improve public health and population health.

A *Vital*signs™ released on ACEs prevention in November 2019[1] showed that many of the leading causes of death and health risk behaviors can be significantly reduced by preventing ACEs. This underscores even beyond Injury Center topics that reducing the occurrence of ACEs and disrupting the multigenerational aspect of ACEs can result in tremendous gains in public and population health. Because of this potential prevention impact and the connection between ACEs and NCIPC's other topics, they have elevated ACEs prevention and one of the research priorities of the Injury Center, with the other 2 priorities being suicide and overdose.

A few months ago, NCIPC released its first *National Center for Injury Prevention and Control Adverse Childhood Experiences Prevention Strategy*[2] that provides the roadmap for how the Injury Center's work across research, surveillance, practice, communications, policy, and partnerships fit together. The goals and objectives of the strategy are to: 1) prevent ACEs before they happen; 2) identify those who have experienced ACEs; and 3) respond using trauma-informed approaches in order to create the conditions for strong, thriving families and communities where all children and youth are free from harm and all people can achieve lifelong health and wellbeing. The strategy also strives to affirm NCIPC's commitment to understanding and addressing the social and structural inequities that put some children at greater risk for experiencing ACEs that exacerbate the impact of ACEs if they do occur. The Injury Center's four strategic goals laid out in the strategy are to:

1. Support surveillance of ACEs and data innovation to guide ACEs prevention, identification, response, and evaluation efforts;
2. Expand the ACEs evidence base by conducting and supporting innovative research and evaluation;
3. Build local, state, tribal, territorial, and key partner capacity to implement ACEs prevention and response policies, programs, and practices based on the best available evidence; and
4. Increase awareness and understanding among key partners of the public health approach to preventing, identifying, and responding to ACEs.

To support policy and programmatic work in communities, NCIPC also has released *Preventing Adverse Childhood Experiences (ACEs): Leveraging the Best Available Evidence.*[3] The purpose of this prevention resource tool is to help states and communities leverage the best available evidence to prevent ACEs from happening in the first place, as well as lessen harms when ACEs occur. This resource includes several strategies drawn from the CDC Technical Packages to Prevent Violence[4] that span the Social-Ecological Model. Across the CDC Technical Packages there are several strategies that can prevent ACEs from happening in the first place as well as strategies to mitigate the harms of ACEs. The evidence tells us that ACEs can be prevented by:

- ❑ Strengthening economic supports for families
- ❑ Promoting social norms that protect against violence and adversity
- ❑ Ensuring a strong start for children and paving the way for them to reach their full potential
- ❑ Teaching skills to help parents and youth handle stress, manage emotions, and tackle everyday challenges
- ❑ Connecting youth to caring adults and activities
- ❑ Intervening to lessen immediate and long-term harms

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[1] https://www.cdc.gov/vitalsigns/aces/index.html
[2] https://www.cdc.gov/injury/pdfs/priority/ACEs-Strategic-Plan_Final_508.pdf
[3] https://www.cdc.gov/violenceprevention/pdf/preventingACES.pdf
[4] https://www.cdc.gov/violenceprevention/communicationresources/pub/technical-packages.html

There are evidence-based and evidence-informed interventions, policies, and practices under each of these areas. This is NCIPC's roadmap for communities to look at comprehensive ACEs preventions and think about implementing those strategies. While the Injury Center has an overall strategy and a prevention resource based on the best available evidence, they recognize that there is a great need for more research to better define and measure ACEs, understand risk and protective factors along the levels of the social ecology, and develop and evaluate interventions for both primary prevention of ACEs and the mitigation of ACEs-related harms. Research also needs to be expanded to better understand how to best increase adoption of implementation of evidence-based interventions. That relates to the discussion for this meeting, which regards presenting NCIPC's current thinking on its ACEs research priorities.

In closing, CAPT Jones emphasized that feedback is welcomed from the BSC in terms of whether the Injury Center is striking the right tone, focusing on the right things, calling out equity in the most appropriate ways, highlighting opportunities that they did not think of, et cetera. He thanked Drs. Niolon and Bacon for their leadership and the many dedicated Injury Center staff who have gotten them to this point. People have put in many hours to review the science, what has been funded in the past, and what gaps exist and have been very thoughtful about how NCIPC structures and focuses its research priorities. Two foundational principles have guided this work that he asked the BSC to keep in mind when thinking about these presentations. The first principle is that the research priorities were built from a health equity lens. NCIPC wants to ensure that all priorities contribute to closing the gap in health inequities that drive ACEs and so many of the other topical areas at the Injury Center. The second principle is that ultimately, all of this work should contribute to more effective prevention identification and response efforts to ACEs. They do not want to do research for the sake of research. Instead, they want to conduct research to guide policy, program, and practice initiatives on the ground to help move the field forward.

Research Priorities for Prevention, Intervention, Identification, and Response

Phyllis Holditch Niolon, PhD
Senior Scientist for ACEs Prevention
Division of Violence Prevention
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Dr. Niolon pointed out that as the field of ACEs research has evolved over time, researchers have begun examining other traumatic experiences outside of the original 10 ACEs examined in the landmark Kaiser and CDC study and research studies that immediately followed it in the 1990s. The Kaiser and CDC study was instrumental in establishing the link between childhood trauma and adversity and a host of negative physical, mental, and behavioral health outcomes well into adulthood. In addition to these 10 original ACEs, NCIPC is also considering other potentially traumatic experiences that might be considered ACEs, especially as they apply to the experiences of all children as the original ACEs study was conducted in a majority white, majority middle-income sample. They are now taking a health equity lens approach to the process and the development of these priorities. Many subsequent studies have demonstrated

the link between the original 10 ACEs and other expanded ACEs on a host of negative outcomes well into adulthood. Therefore, preventing ACEs and mitigating their consequences is essential to improving public health across the lifespan.

In terms of the scope, the goal of this effort was to assess NCIPC ACEs research efforts, conduct a gap analysis, and draft the Injury Center's first ACEs Research Priorities. It is important to remember that these are the first ever ACEs research priorities for the Injury Center. It is also important to note that these are NCIPC's priorities. In the process, gaps and areas that are in need of very important research were identified, some of which are outside of NCIPC's lane or might be outcomes for which NCIPC would not be able to achieve demonstrable progress in the next 3 to 5 years.

Dr. Bacon described the ACEs Research Priorities Workgroup process and roles. She emphasized that while she and Dr. Niolon have served as Co-Leads on this effort, this was a cross-center collaboration they wanted to take the time to recognize and thank the amazing group that is responsible for the draft of the priorities that they shared with the BSC. The draft priorities reflect the insight, expertise, and significant effort from this group. She acknowledged the time and level of effort and commitment that this group offered, particularly in light of a lot of COVID deployments, repeat deployments for some folks, and a relatively short timeline. Everyone in this group made this work and this project a priority and shared their time and expertise generously. She and Dr. Niolon were continuously grateful and inspired by this group.

This process was broken into 3 phases. Phase 1 was a planning phase during which a roadmap and timeline were established. Dr. Bacon offered a special note of thanks to Dr. Greenspan and her Office of Science that oversees and supports all of the Injury Center's research priorities. They had the benefit because of their work of starting with a prescribed process and structure, and they also had the benefit of Dr. Greenspan's advice, guidance, and support throughout the process.

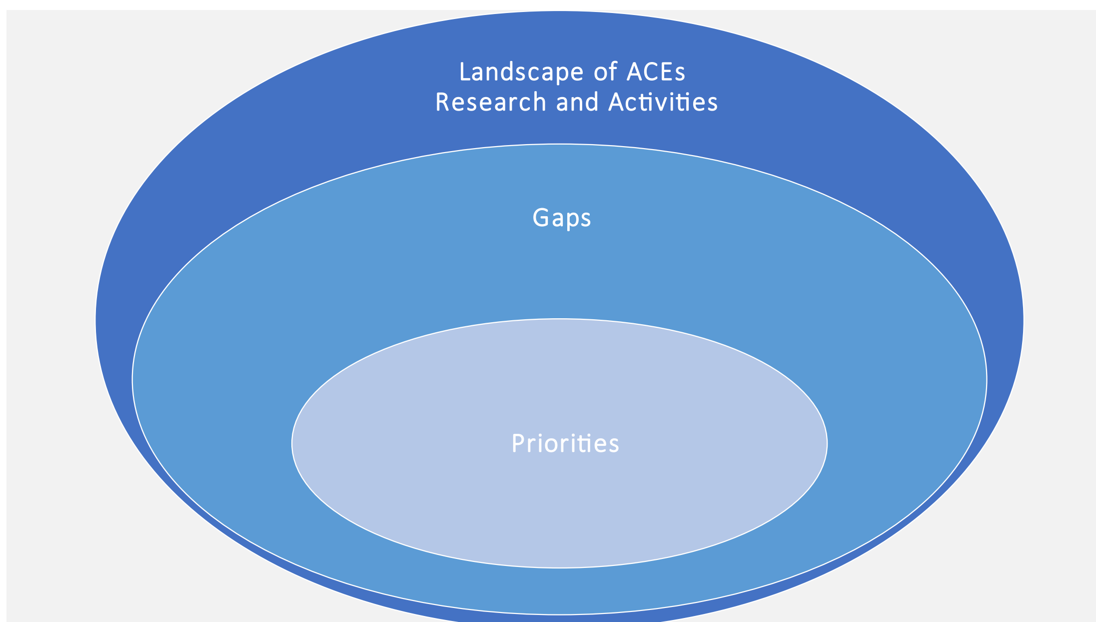
Phase 2 was really the heart of this work during which the Injury Center expertise was brought to bear. A rigorous and comprehensive review was conducted of the ACEs literature to ensure that they could draft priorities that would use that body of work as a springboard from which to move their work forward. They had the immense benefit of starting from an edited volume that was devoted specifically and explicitly to ACEs research. That resource was used to identify gaps as of the beginning of 2019. That made it possible to focus on the literature and work that has emerged in the field from that point forward to determine what gaps and priorities remain. They reviewed all of the systematic reviews and meta-analyses from late 2018 forward and also assessed over 800 other empirical papers for their potential contribution and review for this process. Those findings were then synthesized and a gap analysis was generated. That was the starting point from which to then narrow in on the Injury Center's specific priorities that the BSC reviewed in the draft document and that Drs. Niolon and Bacon planned to summarize during this meeting.

Phase 3 was designed for feedback, sounding boards, and a whittling and honing process for the NCIPC priorities. There were multiple rounds of rigorous feedback and revision internally and externally. The external reviewers were particularly helpful in clarifying the voice, intent, and objectives of the priorities and in helping to cut down some of the noise that was in some of the earlier drafts. Dr. Bacon said she kept finding herself thinking of a metaphor of a big ill-formed chunk of stone that they gradually chipped away at, shaved, and honed down into what they hope is a clearly identified and clearly articulated sculpture. Everyone internal and external was instrumental in achieving that vision.

The following were the guiding or sensitizing questions that gave the group helpful touchpoints and a decision-making litmus test as they worked through the process to guide the spirit, scope, and outcomes of the process:

- ❑ What is the state of the ACEs field with respect to research on surveillance and health burden, etiology, prevention, and dissemination?
- ❑ How has CDC research (extramural & intramural) contributed to the state of the field?
- ❑ What are the important gaps in our empirical knowledge of ACEs?
- ❑ Which gaps are most important to prioritize to advance progress in the field of ACEs?
- ❑ Have we identified and prioritized research goals that 1) will advance the science; 2) are within NCIPC's purview; and 3) can result in measurable progress in 5 years?

There is a funneling of the questions as they progressed from the general landscape to gaps, to priorities within those gaps, to actionable priorities, and so forth. This visual representation of this funneling process was a consistent touch point or reminder for the group as they worked through building the priorities:



The reviewers helped them keep in mind that the intended product was much narrower than a gap analysis. They had to land on things that would be actionable and within the NCIPC's purview and lane. Some things that were identified as gaps did not emerge as priorities because they were outside of NCIPC's lane, such as markers of toxic stress or the specifics of neurotransmitter or hormonal mechanisms that link ACEs to later outcomes. Other things that emerged as gaps did not necessarily make it to NCIPC's priority status because they are well-established already. While some research advancement may be novel, it would not necessarily provide further actionable information. This would be things like the consequences of ACEs. It is known sufficiently well enough that it is necessary to act on ACEs, even if there are additional consequences that have yet to be empirically established.

Dr. Bacon first provided a quick summary of the key findings of the landscape review and then focused on the gap analysis in the spirit of sharing the context from which the priorities then emerged. In the course of review of the literature and assessing candidates for the categories or domains of priorities, all of the following were under consideration at some point. Notably, several but not all of these content areas are reflected in the priorities. However, the workgroup tried to organize and streamline these into an actionable and more cohesive set of priorities:

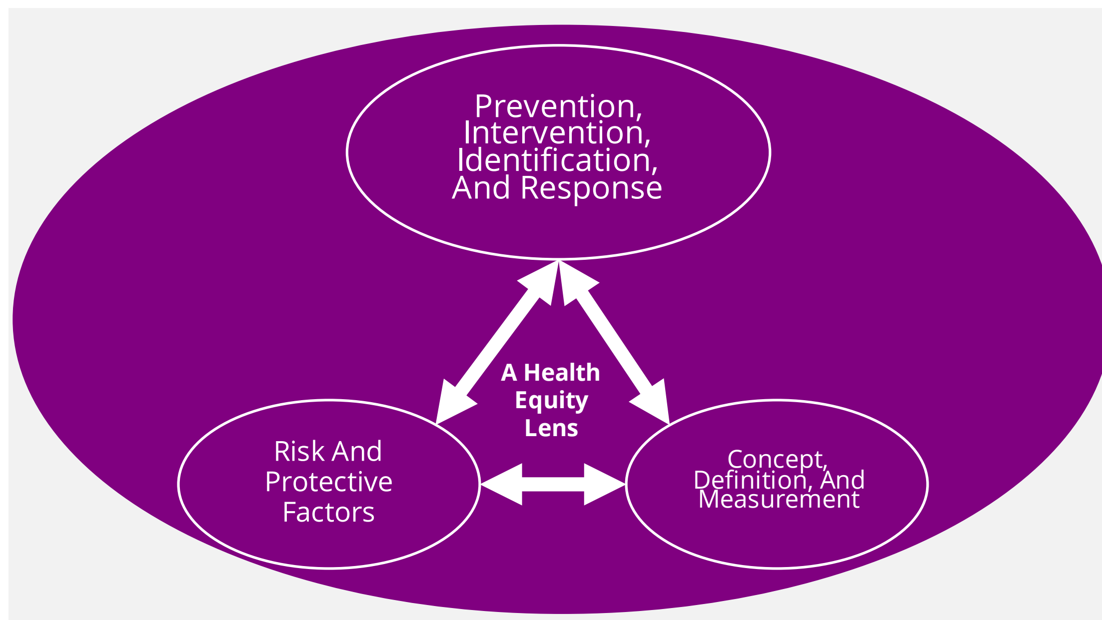
- ❑ Concept and definition
- ❑ Measurement
- ❑ Consequences
- ❑ Mechanisms of impact
- ❑ Risk factors
- ❑ Protective factors/Resilience
- ❑ Primary prevention
- ❑ Intervention
- ❑ Trauma-informed care
- ❑ Implementation science

The first overarching priority relates to the concepts, definition, and measurement of ACEs. To set the stage, Dr. Bacon covered what emerged in terms of the gaps and priorities within those gaps. It is known that the original 10 ACEs consistently predict a wide range of negative outcomes across the lifespan but do not capture the full range of adversities and trauma that a child can experience, and that the original measurement does not reflect the experience or context of all children. It is also known that the measurement of ACEs is robust in that the relationships and consequences are clear across different data, time periods, and populations. However, there is also a fairly rudimentary form of measurement that just captures a Yes/No with respect to the various types of adversity without consideration for developmental timing of onset, severity, frequency, chronicity, et cetera of these experiences. This priority alone could set the stage for a career's worth of research. This was a topic where the workgroup felt a constant pull "into the weeds." Given that it is very easy to "go down a rabbit hole" for some of these questions, the group worked hard to ensure that the priorities they pulled out of this contribute to setting the stage for more effective prevention and intervention. They think they have been successful in attending to the "so what" factor of the questions on which they did land within this priority.

Another priority has to do with risk and protective factors for ACEs. Here again, the group had to navigate the tension between the fact that a lot is known, but more needs to be known in order to refine the prevention and intervention evidence base and strategies. A lot is known about risk for ACEs exposures, especially at the individual and family levels. Less is known about how health and social inequities constitute risk in and of themselves and how they amplify that risk for and exacerbate impacts of ACEs that may exist at the individual and family levels. In addition to that, a lot of what is understood about risk and protective factors relates to risk for individual types of ACEs rather than risk for the overall combined set of accumulated ACEs. While it is also known that risk of ACEs echoes across generations, a more nuanced understanding is needed of the mechanisms that drive that risk. There is excitement about the emerging knowledge about protective factors and there is a research base for this, but it is also important to look for opportunities to more fully develop this in order to use it to build strategies to make people, families, communities, institutions, and systems safer and healthier.

There is certainly enough available evidence and insight to take action now with respect to prevention, intervention, identification, and response to ACEs. A deeper, more refined, more actionable, and more universal evidence base for all of these issues and strategies is certainly the point of everyone's work with respect to ACEs. It should come as no surprise that this is the priority among the priorities and a priority area that the other priorities are intended to serve and set the foundation for. The best available evidence supports a range of prevention and intervention strategies to prevent and mitigate ACEs, particularly for certain types of ACEs. Among existing evidence-based strategies, most have been tested among majority populations. That leaves significant gaps with respect not only to what works for whom, but also what works to actively close the gaps between those most and least at risk. There also are significant gaps with respect to ACEs screening and trauma-informed care. Screening for ACEs in clinical settings is an emerging practice with implications for linkage to prevention and intervention resources, but it falls outside of NCIPC's purview as public health practitioners. However, it does have critical implications for linkage to care and linkage to resources. NCIPC has identified gaps in its understanding of how the Injury Center can inform that practice to ensure that screening connects with applied public health. There are also important gaps related to the potential unintended consequences of screening, such as insurance coverage and referrals to child welfare authorities. Potential unintended consequences need to be carefully considered and managed and should be informed by research and empirical insights. Trauma-informed care certainly will continue in practice and is more robust than the research base behind it. This interdisciplinary across center collaboration was comprised of the perfect collaboration of people for the small group to help them keep top of mind the fact that ACEs prevention and response is primary prevention of a host of other violence and injury outcomes. There are gaps in the empirical research examining the intersectional nature of ACEs with these other areas.

Dr. Niolon described how the group prioritized those gaps and how they propose to address them. She shared this graphic to illustrate the two strategic themes that have guided the work in developing these research priorities:



She emphasized that this entire process was built from a health equity lens, and that they want to ensure that all of the research priorities they have developed are intentional about addressing social and health inequities and reducing the gaps that are created by them. They also wanted to illustrate that the first two priorities of concept, definition, and measurement and risk and protective factors are intended to be in service of the overarching and third priority of applied prevention and intervention—the "bread and butter" of the public health response to addressing ACEs. Dr. Niolon reviewed the proposed research gaps and priority questions.

How can the concept, definition, and measurement of ACEs be refined to support the most effective and equitable approaches to prevention and intervention?

Research that advances the conceptualization and measurement of ACEs is critical to being able to measure the impact of prevention, intervention, and response strategies, and is therefore an integral part of the Injury Center's research priorities. ACEs have traditionally been conceptualized and measured as ten types of childhood adversity, including three forms of violence/abuse (physical, sexual, and emotional); two forms of neglect (physical and emotional); and 5 types of household challenges (growing up in a household where there is intimate partner violence (IPV), an incarcerated household member, adult substance misuse, adult mental health problems, or divorce/separation). However, several gaps in research on the definition and measurement of ACEs have emerged as ACEs research has evolved. The following questions are examples of research questions that would allow NCIPC to empirically address these gaps in ways that would advance our understanding of ACEs and contribute to greater clarity and precision in defining and measuring ACEs and their impact:

- ❑ Should the types of adversities included in the definition and measurement of ACEs be expanded, either to include additional experiences within each type or to add additional types of ACEs to the 10 traditionally measured ACEs? How can we ensure that our scientific and research process for considering expanded ACEs is equitable; that is, that such research reflects the experiences and contexts of all populations? What criteria should be used to determine what is or is not an expanded ACE? How should measurement of ACEs adjust to accommodate an expanded definition of ACEs?

- ❑ Should certain social and health inequities, such as living in a context of structural racism, colonialism, poverty, and discrimination, be included in measures of ACEs, or should they be conceptualized and measured separately as risk factors within community and societal contexts that increase the risk for experiencing ACEs and exacerbate their impact? Relatedly, how do we best measure risk and protective factors for ACEs at the community, societal, and systems levels to better understand how to address them in terms of prevention of ACEs and mitigation of their impact?

- ❑ In which contexts should ACEs be measured as an accumulation of different types of adversity, and in which contexts should they be measured as unique individual adversities, in a way that allows measurement of their chronicity, duration, frequency, severity, and developmental timing?

- ❑ What are the most reliable and valid assessment tools and methods to measure ACEs across developmental stages? Specifically, how can we best align constructs assessed, who we ask and how we ask with the developmental stage? How does the developmental timing of ACEs moderate their relationship with outcomes? Are there "critical periods" in which the effect of different adversities is magnified or intensified?

- ❑ Most ACE studies focus on adult health outcomes. What are the immediate- and short-term outcomes associated with ACEs in early childhood and adolescence? How do these early childhood and adolescent outcomes mediate and serve as mechanisms or pathways to the more well-established long-term adult outcomes of ACEs?

How can we advance research on risk and protective factors for ACEs, especially at the community and societal levels, in a way that informs effective and equitable prevention and intervention strategies?

Research that advances our understanding of the conditions and experiences that both create risk for ACEs and protect against ACEs is critical to effective and equitable ACEs prevention and intervention. A fair amount of research on risk factors for individual ACEs exposures exists, but most of these risk factors are at the individual and family levels rather than at the community and societal levels; less is understood about how social and health inequities can create higher risk for experiencing ACEs and amplify the consequences of ACEs. Protective factors for ACEs are not quite as well-researched as risk factors, but research is beginning to establish several protective factors at the individual and family levels, sometimes referred to as Positive Childhood Experiences, or PCEs. As with risk factors, there is a dearth of research on protective factors at the community and societal levels. More research on risk and protective factors at the community and societal levels, as well as a the individual and family levels, will help identify the most salient and modifiable risk and protective factors for prevention and intervention strategies to target. The following research questions will help advance our understanding of risk and protective factors, especially those at the community and societal levels and those which relate directly to social and health inequities, so that we can target our prevention and intervention efforts in a way that will effectively and equitably address ACEs and their consequences:

- ❑ How do the persistent social and health inequities that families face across generations perpetuate risk for ACEs among parents/caregivers and their children? What mechanisms underlie the intergenerational transmission of ACEs, and how can this knowledge translate into both primary prevention of ACEs and interventions to mitigate their consequences? Which protective factors can be empirically established as critical for disrupting this risk across generations?

- ❑ What are the most robust risk factors for ACEs at the individual and family levels? Among the empirically supported risk factors for *individual* ACE exposures, which risk factors are the strongest predictors across *multiple* ACEs exposures?

- ❑ What are the most robust risk factors for ACEs at the community and societal levels? How do social and health inequities (e.g., poverty, structural racism, colonialism) increase the risk for experiencing ACEs and amplify their impacts across the life span? Which are the most modifiable community/societal level risk factors for ACEs, and how can this knowledge inform policy-level and community-level interventions to reduce these risks?

- ❑ What are the most robust protective factors for ACEs at the individual and family levels (e.g., PCEs)? Among the empirically supported protective factors for *individual* ACE exposures, which factors are protective across *multiple* ACEs exposures?

- ❑ Does the accumulation of protective factors at the individual and family levels (e.g., PCEs) both prevent ACEs from occurring and mitigate the association between ACEs and empirically established outcomes?

- ❑ What are the most robust protective factors for ACEs at the community and societal levels? How does addressing social determinants of health (SDOH) (e.g., policies to promote equity and access to resources) decrease the risk for experiencing ACEs and interrupt their impacts across the life span? Which are the most modifiable community/societal level protective factors for ACEs, and how can this knowledge inform policy-level and community-level interventions to reduce these risks?

- ❑ What cultural and community strengths, which may be specific to certain racial/ethnic, religious, geographic, and other groups and communities, are most important in understanding protective factors for ACEs?

How do we most effectively prevent ACEs and mitigate their impact among those for whom they have already occurred? How do we ensure that our prevention, intervention, identification, and response efforts address inequities?

The key to addressing ACEs and their impact on lifelong health outcomes lies within effective prevention, intervention, and response strategies. As such, all research priorities within this document are in service of the overall goal of preventing ACEs before they happen or mitigating their consequences if they have already occurred. Effective prevention, intervention, and identification of, and response to, ACEs must address the social and health inequities that increase risk for ACEs and exacerbate their lifelong health impacts. In particular, the critical priority is that we identify strategies that are effective at closing the gap between those most at risk and those least at risk. CDC's prevention resource, "Preventing Adverse Childhood Experiences (ACEs): Leveraging the Best Available Evidence," outlines six overarching strategies based on the best available evidence to prevent, intervene, and respond to ACEs. More research is needed, however, to identify effective programs, policies, and practices that prevent ACEs and mitigate their consequences. More research is also needed at all levels of prevention, intervention, identification, and response, from policy-level approaches that address risk and protective factors at the societal and community level to individual screening and response at the individual and family levels. The following questions are examples of research questions that would allow NCIPC to empirically address these gaps in ways that would advance the research on prevention, intervention, and response and effectively address ACEs and the health and social inequities that underlie and exacerbate them.

Prevention and Intervention Effectiveness Research

- ❑ To what extent does addressing social and health inequities prevent the occurrence or mitigate the impact of ACEs? What social and economic policies can prevent ACEs, mitigate their consequences, and reduce inequities? For example, are interventions that address structural racism effective at preventing intergenerational transmission of trauma and risk for ACEs? Similarly, do these policies and interventions lead to more PCEs?

- ❑ Are ACEs prevention and intervention strategies with evidence of effectiveness among majority populations equally effective for other populations, particularly sub-populations and groups who are experiencing social and health inequities that put them at greater risk for ACEs? What prevention and intervention strategies need to be evaluated for effectiveness among these populations and what adaptation and implementation factors must be considered to ensure that they are addressing the underlying conditions that contribute to inequities?

- ❑ To what extent do policies, programs, and practices intended to prevent ACEs or mitigate their impact create differential access to resources and reach their intended populations? How do we ensure that these strategies and policies reduce rather than exacerbate social and health disparities related to ACEs?

- ❑ Which evidence-based and evidence-informed policies, programs, and practices that have been shown to reduce risk for one specific ACE are effective for reducing risk for a broader range of ACEs? Are interventions that are focused on risk and protective factors that are shared across ACEs effective at reducing multiple ACEs?

- ❑ Are interventions conducted with an intergenerational ACEs prevention framework effective at simultaneously addressing the mitigation of the consequences of ACEs in one generation and achieving primary prevention of ACEs within future generations? For example, substance use interventions can take a family-based approach, simultaneously conducting intervention with the parent who uses substances through a trauma-informed approach, and preventing their children from experiencing certain ACEs (e.g., growing up with a caregiver who experiences substance use problems). What innovative and new strategies that address intergenerational continuity of risk can be developed and rigorously evaluated?

- ❑ Which programs and policies are effective for promoting protective factors at the individual, family, community, and societal levels? Among these, which are most effective for creating the conditions for children and families to thrive?

Identification and Response

- ❑ Is screening for ACEs an effective tool for intervention to mitigate the consequences of ACEs? What does effective screening entail and how, and in what settings, is it best implemented? What are the benefits of screening for ACEs and what, if any, potential unintended consequences might it have? For example, in states that are implementing or considering universal screening in pediatric clinical care settings, how can research inform the process to ensure that unintended consequences (e.g. challenges regarding mandatory reporting to child welfare authorities, negative consequences for insurance coverage and eligibility) are avoided.

- ❑ What are the essential components of trauma-informed care that drive effectiveness for mitigating the impact of ACEs, particularly the impacts related to violence, suicide, and overdose, as mitigation of the impact of ACEs functions as primary prevention of these outcomes?

Implementation Research

- ❑ What are the essential elements or core components of evidence-based ACEs prevention strategies?

- ❑ How can effective ACEs prevention and intervention strategies be scaled up so that they have community- or population-level impact? What adaptions need to be made to address barriers to implementation and fidelity to the prevention and intervention strategies? What systems/infrastructure issues need to be addressed?

- ❑ What are the cost effectiveness and cost-benefits of evidence-based and evidence-informed ACEs prevention and intervention strategies?

- ❑ What are the contextual factors that influence uptake, implementation, adaptation, and sustainability of evidence-based ACEs prevention strategies?

Discussion Points

Dr. Ellis applauded NCIPC for continuing to push what is such a foundationally important public health issue with regard to the tie of ACEs to chronic disease. She found it interesting that during the previous meeting they began with the opioid response work, knowing that a large part of substance use in this country can be tied back to ACEs. The basis of so much disease and despair in this country have their beginnings in ACEs, which the scientific literature supports. Perhaps something for everyone to consider would be to increase the attention on ACEs scores in terms of clinical applications, social work, and such as the importance of context, community, systems, and structures are increasingly understood—particularly with regard to equity. The thinking should also include ACEs and adverse community environments and thus a score on that. Perhaps that would help to both scale and quantify the differential impacts of some of the supports that are missing in communities and some of the gaps to provide the necessary protections as far as protective factors and buffers that are necessary for individuals and families to move forward.

Dr. Bacon expressed appreciation for the comments about the intersectionality and inextricable relationship between ACEs and the overdose epidemic. ACEs, overdose, and suicide are among the 3 priority areas of the Injury Center. Because they are inextricably related in their etiology, prevention, and response, there is an opportunity to have more effective, efficient, and powerful intervention and response when these variables are thought of in concert because that is how they exist. She completely agreed regarding screening and ensuring that even in that setting, they are still really attending to the larger community and societal level contexts in which ACEs occur. Stimulating screening conversations is relatively new with respect to ACEs. An ACEs score is not discussed as a diagnosis. An ACEs score in a clinical setting is just more and better information as part of the health history just like everything else that absolutely should be viewed in the larger context of what community resources or liabilities exist. The point is well-taken and they can look for opportunities in the draft to be more intentional about keeping those community contexts at the table, even when talking about screening in clinical settings and in reinforcing the point that so much of the work has to be about ensuring that the resources are available to respond to everyone in evidence-based and effective ways. Part of that means that when ACEs are identified in clinical settings, community resources should be brought to bear to respond to that.

Dr. Liz Miller emphasized the fact that this is a situation in which practice has accelerated long before the ability to provide an evidence based. As a clinician who has been working in this space for 30 years, she stressed that the ACEs score is not a diagnosis and that kind of language should never be used. The paradigm of turning a score into something that needs to be known is absolutely not acceptable. Regarding Dr. Ellis's point, it is really about the structures, systems, and the fact that this country was founded on genocide and slavery with no attention to reparations much less figuring out community resources, and sitting through another presentation on ACEs that elevates this identification of ACEs when they themselves have not turned the lens onto the structures and systems. She recalled that one of her conversations the previous day had been around mandatory reporting and the criminal justice

response that continues to harm marginalized and minoritized communities. They have to push the research agenda to say that this needs to be demonstrated. Ethically, she has been asked multiple times to test the healing justice-focused work that her team has developed over the last 15 years compared to ACEs screening and a score. As a clinician-scientist, she ethically cannot do research that would score children and their families in this really horrific and frankly racist way. She encouraged everyone to think about the fact that in 2021, they cannot continue to blame children and families for these kinds of situations. Research that continues to drive them toward that does not actually acknowledge the extent to which they are complicit in sitting there grappling with this research without calling out the fact that what they are dealing with here is deeply embedded systemic racism and deeply embedded systems in hospitals' healthcare delivery systems that benefits from white supremacy.

Dr. Bacon emphasized that they wholeheartedly hear and agree with Dr. Miller's comments, and as non-clinicians, they want to make sure that they are very responsible with their language. If there are places in the draft that seem inappropriate, seem to unintentionally have the impact of dismissing the larger influences and underlying realities, or discuss ACEs screening in clinical settings in ways that cause discomfort—the workgroup would welcome input because they want to make sure they get it right. They will take to heart all comments made during this meeting and will do their own work to review the document from that lens. She invited anyone with suggestions about specific language or who wanted to have further conversation to reach out to them.

Dr. Niolon agreed and said that while it may have come out in the presentation, but if not, it was worth mentioning that screening in particular is something that they have struggled with throughout this entire process. They began the process feeling like screening is not really NCIPC's lane and is more clinical practice. As they thought through the process more and spoke with internal and external colleagues, the frightening part that Dr. Miller raised is that it is happening, and is happening at a rapid rate and without the science to undergird it. It is essential to conduct the research that assesses screening, the negative and unintended consequences screening can have for children, the outside contextual influences, and how all of that influences this process. If it continues to move forward at this rate without acknowledgement of how racism, colonialism, and so many other elements have factored into the inequitable experience of ACEs, ACEs scores, et cetera, it will be letting practice run away without the proper science to guide it—even if it is guiding away from ACEs screening. She emphasized that they have struggled with this throughout the process of developing these priorities and they welcome insight, feedback, and advice on better language to use so that they get this right.

Dr. Cunningham echoed Dr. Miller's comments. As a primary care provider who has been working in the South Bronx for over 20 years, she has been observing exactly what Dr. Miller mentioned about the systems that have been created that people live in and is mindful about how that impacts communities and the needed responses at community and policy levels. She commended CDC for taking a health equity lens that is absolutely critical and for being explicit in the strategic planning. With that in mind, she asked whether experts in health equity were included in this process. That was not clear to her and, if not, it certainly is warranted. In terms of the very top line strategic goals, she did not recall seeing health equity language. While it came out later, she thought it needed to be woven throughout beginning with the top-line goal. Being very explicit about this is critical. In terms of the timing of this strategic plan, it surprised her that nothing about COVID was included. Perhaps it is embedded or separate, but at their health department in New York City, they are trying to wrap their brains around trying to understand the impact of COVID on ACEs and where that fits in this larger strategic plan.

Dr. Niolon indicated that they have struggled throughout the process with the COVID pandemic and how to weave that in. Original drafts had a separate paragraph about taking a health equity lens and how focusing on doing that with all of NCIPC's research going forward is really important for addressing the current pandemic, natural disasters, and other things that come along in the future. Issues like the COVID pandemic have done nothing but highlight all of the social and health inequities that exist within this country and globally and further exacerbate ACEs, their impacts, et cetera and the need to address equity in the way that all public health problems are approached, including COVID and any future pandemics and other types of global disasters. The language was taken out after feedback was received that although these priorities focus on the next 3 to 5 years, they are really meant to be more evergreen and not focused on the exact moment in history in which these research priorities were written. They have struggled with keeping it in or taking it out and can certainly consider adding it back into the language.

Dr. Bacon agreed that health equity needs to be named front and center, early, and often. She asked Dr. Cunningham whether she felt that was the case for the written version and the discussion during this meeting, or it was limited to one or the other context. She stressed that they want to make sure they are attending to it in all settings. They do want to write this in a way that the emphasis on equity is not missable.

Dr. Cunningham said it was possible that she missed it, but she felt like the top line did not have an emphasis on equity, though she did see it later within the more specific questions. She just thought that it needed to be explicit at all levels.

Dr. Greenspan added that the Injury Center has been struggling with the issue of health equity in terms of all of its research priorities. The question regards whether to call it out separately and have very distinct goals for health equity, or if it should be woven through out all of the goals and priorities. She invited further comments on this because as they review all of their priorities, this is top of mind.

Dr. Pacula said that personally, she thought the way to address social equity is to bring it into each and every aim because there are different ways of thinking about it in pursuing some of the aims. Social equity is thought of more or less when thinking about particular parts of the problem. In terms of something that came to her as she was reading the call for research and listening to the priorities, she is an economist who has been connecting work on the environmental factors influencing substance use from early adolescence throughout the life course and drawing a lot on the environmental factors for a little over 25 years now. As such, she is familiar with some of the available data in those areas. Something that is missing from the conversation and in reaching the priorities and call so far is a nudge to the scientific community to pursue some "low hanging fruit." An important priority was mentioned as being the connection between early ACEs and some of the intermediate childhood outcomes that can then connect to adult outcomes and determining the factors that can mediate that. In order to do that research, she thinks that scientists are going to start thinking about what they need to do better with today's measures of ACEs going forward, which will make it take a very long time to get the information needed. In terms of "low hanging fruit" she thinks of looking back at some of the already existing, important, and valuable data sources that were constructed perhaps for other purposes because they were focused on maybe only one of the ACEs target areas, such as the National Longitudinal Study of Adolescent to Adult Health (Add Health), National Longitudinal Survey of Youth (NLSY), Social Development Project, and a number of other specific longitudinal datasets that contained information on the family and the child and may have coded information available to researchers so that scientists can start digging in more

carefully to some of the other environmental aspects. The reason she thinks this is valuable is that she does not think researchers will necessarily look at this if not nudged in this direction. The way ACEs are defined today and would be measured in a survey is not necessarily how they were measured in the past. There is a trade-off between better specific measurement and definitions today versus the ability to look at a group of related behaviors and some of the mediating factors. When scientists review each other's work, they tend to be very focused on the best science today. If the CDC in its call nudged people to take advantage of existing data to gain some insight, even if it is not the best measure of ACEs today, it could provide much needed information on a gap and can help direct research going forward into the most promising areas. As someone who has obtained National Institutes of Health (NIH) funding for 25 years, she has found that those sort of guidance from the funding agencies are really helpful in the review committees in terms of seeing proposals that take advantage of those opportunities. Therefore, she would include language that nudges researchers toward "low hanging fruit" that CDC reviews as promising having already reviewed this literature.

Dr. Bacon said that they wholeheartedly agree and can probably incorporate the nudge that Dr. Pacula suggested, particularly with respect to mechanisms and pathways and any of the research questions they are proposing that require longitudinal data. She reiterated that the measurement does not always have to be perfect or a cohesive ACEs scale. In fact, one of the challenges they encountered in the course of the landscape review was the fact that any social and behavioral health science touches on ACEs in the literature at some point. Breaking out the ACEs scales and measures, there were 20 plus odd disciplines that they could have explored for their insight on ACEs. They enthusiastically endorse strong insights from different fields where perhaps there is a disaggregated approach to ACEs. In the spirit of affirming that they are addressing this, NCIPC has an internal working group focused explicitly on the Add Health data and they have discussed mapping their activities as an internal research group onto these priorities because there are so many that the Add Health data can help them address. There are a lot of available data and they will enthusiastically support, promote, and engage in research that leverages existing longitudinal data to explore some of these questions, such as the Adolescent Brain Cognitive Development (ABCD) Study and Healthy Brain and Child Development (HBCD) Study. It does not have to be perfect to be helpful.

Dr. Compton emphasized that the National Institute on Drug Abuse (NIDA) and other NIH institutes have supported many of the longitudinal studies that could be wonderful learning opportunities for testing some of the ideas posed. He would put the HBCD in the long-term vision. ABCD is medium term because they have already gotten to about age 12 or 13 years, so they are beyond the baseline and at least partway through some of the important developmental milestones. That could have a unique way to augment the existing research. He highlighted other research studies as potential for secondary analyses or further exploration, such as a number of large-scale prevention trials that in some ways could be thought of as experimental epidemiology, so the comparison group becomes essentially a longitudinal cohort. This offers the added advantage of testing promising techniques that might ameliorate some of the risks that are embedded within the ACEs. Not too many of them are focused explicitly on ACEs per se, but many of them focus on components that are part and parcel of the ACEs paradigm such as Dr. Gene Brody's work in Georgia, work in Iowa and Pennsylvania, and large-scale studies that have tested and show very promising results for some of the family-based interventions, family support, and the family strengthening concept as a key element. Within health equity, his sister agency at NIH, the National Institute of Environmental Health Sciences (NIEHS) in North Carolina, has quite a portfolio on health equity related to environmental justice. Their version of the environment is more toxic elements in the environment. COVID and environmental issues might be factored in like a literally biologically

toxic environment or exposure to flooding and climate justice issues as some of the examples of how the social and individual factors being highlighted interact in meaningful and devastating ways with external, broad-based, issues like climate change, toxic pollution, infectious diseases, et cetera. That might be a way to include COVID as one example of many that will have to be considered over time. There is a lot to digest and think about here. In general, NIDA and other NIH institutes are delighted to partner with CDC to help move this entire field forward.

While the discussion has not focused particularly on clinical applicatinos of ACEs, this topic resonated for him. While he has not completely thought through the issues, understanding how ACEs and ACEs scores are gaining traction in clinical practices. The evidence base for clinical use of ACEs is minimal (in terms of what to do with them or how useful they are) and this lack of evidence is somewhat unnerving to him as a clinician. The future may include both implementation of evidence, but also de-implementation of non-evidence related to ACEs in clinical settings.

Dr. Niolon said she loved the idea of not only thinking about longitudinal studies, but also thinking about the prevention and intervention longitudinal studies as rich datasets for NCIPC to consider as well. They would be grateful for comments and feedback about exact places to weave that in and make those ideas more specific in the priorities. They struggled constantly throughout the process in terms of wanting to have research questions even within the bullets of example research questions that are high level enough that they were getting their point across but not being so specific that they were directing very specific research questions and hypotheses. The point is a good one that this is also an opportunity to nudge people toward the use of these rich and existing datasets as ways of examining mechanisms and pathways and thinking much more broadly about external forces—not just social and health inequities in the way they are typically thought of, but also things like climate justice as an SDOH and an external factor that externally and contextually influences the individual experiences of children and families.

Dr. Bacon added that she wrote down and loves the phrase of “de-implementation of non-evidence” as a lovely way to capture what is a significant challenge in this work. She emphasized that research is a piece of how this will be done, but she feels that it is almost more critical to address messaging issues—how they talk about it with all of their partners (e.g., communications, policies, programs), not just research partners. She appreciated that in the context of a research conversation that was still top of mind and a subject for conversation. Research is just one component of how they will achieve the “de-implementation of non-evidence” and that there are other very important venues to tackle as well.

Dr. Lumba-Brown observed that the presentations highlighted many questions that remain regarding the definition, concept, and measurement of ACEs. She appreciates that this is an extremely high priority and agreed with the need to consider social inequity in all aspects of this work. Research without thoughtful implementation strategies can stall the most important of efforts. She requested that NCIPC share the concurrent implementation plans, strategies, and measures that the teams are proactively considering and what the next steps are.

Dr. Bacon agreed and indicated that they tried to allude to this in the implementation section by talking about understanding barriers and facilitators to implementation, adherence to fidelity, and identifying core components. While they did not have much to offer at this point in terms of action plans around that, they do agree with the importance of having action plans as part of their vision for next steps on executing this agenda. Thoughtful planning is needed, with implementation addressed as being equally important with the research being done. They have

a fantastic implementation team embedded within divisions and across the Injury Center who are at the table to address that implementation planning happens alongside and not after the prevention effectiveness and other research.
Dr. Niolon added that after the feedback is incorporated from this meeting, they will get the product to the point that they think it is final and they have done a good job of incorporating the feedback. Then it will go through the CDC clearance process and be published. It certainly will guide internally all of their extramural and intramural research planning, but they do not have a specific implementation process beyond that which is ready to present.

Dr. Ondersma supported the emphasis with the possibilities of using existing datasets, especially in terms of being very clear about that. Investigators will not submit proposals to examine existing datasets unless grantors are very explicit in saying that they accept or welcome that. As Dr. Maholmes mentioned, the Environmental influences on Child Health Outcomes (ECHO) Program is another option. ECHO is a huge initiative and ACEs are part of the preferred ECHO-wide measures. It is not clear how many cohorts will pick them up. While they do not have to, he expects that quite a number will. That is a tremendous framework for making great data available. He also seconded the issues around using screening scores in the clinical context and noted that in general, there is such a cyclical nature to research initiatives and concepts like ACEs, he wondered whether there was discussion about highlighting some of the healthy skepticism pertaining to ACEs. Of course, good science involves good skepticism and should always be part of that. Even in the Funding Opportunity Announcements (FOAs), it is too easy for initiatives like this to only receive application submissions from those who are very enthusiastic about a particular approach or believe that CDC is enthusiastic about it. Specific language encouraging alternative frameworks, explanations, and even skeptical approaches could be very beneficial and keep them from just contributing to that kind of waxing and waning of enthusiasm.

Dr. Bacon said the point was well-taken that perhaps in this work and all FOAs that they put forward, that they could encourage rigorous and healthy skepticism. She made a note and will circulate this among all of their colleagues. They do have allies in this work. There is an open Health Resources and Services Administration (HRSA) FOA and she is encouraged about looking at best practices for implementation and screening and hopeful that it will yield some of that robust conversation and the healthy skepticism that lets them work toward getting it right in a responsible and sustainable context.

Dr. Niolon added that she liked the idea of FOAs that specifically ask for researchers to use existing longitudinal datasets and think constructively about how they can be creative about identifying ACEs variables and information in datasets even when they are not labeled as ACEs the way they are currently thought of or studied. That already has a lot of excitement and traction internally within the Injury Center, so she hopes they are able to continue that nudge in these research priorities.

Dr. Chou echoed some of the other comments about being careful with regard to scales and measurements, which can encode biases and reinforce them. There are numerous examples of race bias algorithms and how difficult it is to get rid of those once they get into practice. They do not want these things to have wide uptake that takes years to abandon, such as occurred with the measurement of renal function. There are other groups like the United States Preventive Services Task Force (USPSTF) and the Community Preventive Services Task Force (CPSTF) that have recommendations on prevention of child maltreatment (CM) that perhaps they have not examined through the broader lens of ACEs. It seems that all groups are trying to look at this with an equity lens now, so it would be useful to work with those groups as they make

updates. His main area is overdose and substance use and it is not totally clear to him how ACEs are defined, but the substance use issue in adolescents is becoming a major issue. They have seen a dozen overdoses in high school youth in his community, which he thinks is happening everywhere. The ACEs seem to be defined as being exposed to that kind of setting and it seems to him that substance use in itself is an ACE. While he is not sure how that plays into the definition, he is very interested in that in terms of prevention and how that impacts development and subsequent outcomes.

Dr. Bacon said that Dr. Chou's observation that bias could be encoded into measurement and the other conversations during this session had been helpful for her to start crystalizing the opportunities in that section of the research priorities to explicitly address that. Several people made that point very convincingly throughout the day, which is exactly why they welcome these conversations. There are some opportunities in the section on concept measurements and definitions to be much plainer about ensuring that current measurement and advances in measurement, conceptually in whatever direction it moves, that they are actively working to not perpetuate and, in fact, hopefully reverse some of the encoding of the bias that is already there. As pointed out earlier, those ACEs experiences do not just reflect the individual in the family. They are manifestations of the larger systems in which we all exist. They will work to make that much more explicit throughout, recognizing that there is a particular opportunity in that section. Regarding substance use and adolescents and the insidious, cyclical, self-defining, self-fulfilling nature of the relationship between ACEs and problematic substance use and overdose in particular, again, it is somewhat of a measurement issue. It is a prevention issue in terms of making sure that there are strategies to disrupt that cycle wherever it is. The experience of substance use itself as an ACE is provocative and compelling and she wants to think more about this.

Dr. Liller commented that it seems like with all of the ACEs conversation, especially now with the concept of positive childhood experiences, things are still at a rudimentary point in terms of our understanding. For example, asking for people to evaluate strategies for change may not be helpful if what researchers have done so far is not what they should be doing. A lot of the literature is not well-founded. Some of the research was not done well. Similar to having to stop a clinical trial at a particular time, she wondered if there would be flexibility or fluidity within CDC as new findings come out about the concept of ACEs to stop and no longer conduct longitudinal studies on strategies that may have been have developed almost inappropriately. his should be done so that better strategies can be studied and implemented.

Dr. Bacon responded that CDC does use updated science to change recommendations for practice, and will adhere to the basic tenants of rigorous science that as they know better they will do better and will be intentional about that.

Dr. Kaplan observed that there are huge limitations with how ACEs have been used. In particular, he is concerned about perhaps even the abuse of ACEs scores. That is to say that the ACEs scores research findings are epidemiological first and foremost and not directly applicable to one individual. He is also concerned that they have stripped away the socioecological context of ACEs. While that has been addressed, he thinks there is a need for the BSC and the CDC to provide some guidance on this issue. Earlier this year, the *American Psychologist* published an excellent special issue on ACEs that he highly recommended. Perhaps they could invite in some of the authors. The article he had in mind was by Ernestine Briggs and colleagues, who noted in a recent issue of the American Psychologist, "we have oversimplified the estimation of risk based on a simple cumulative score." He is a strong

supporter of the long reach of childhood and might even change the "C" in ACEs to perhaps "Community" as opposed to "Childhood" experiences. Dr. Kaplan also noted that adverse experiences cross generations and called for the need to contextualize ACEs . Another article is the "Prisoners of the Proximate" written a long time ago, pointing to the need to look at life course issues. The bottom line is that they need to embrace complexity, widen the lens, and improve ACEs' empirical and conceptual features. The *New York Times* had a headline that many of the programs that were passed and funding opportunities that came out of the response to COVID pandemic have lowered the poverty rate in this country. What a great opportunity to conduct and fund natural experiments to find out the impact that this had. He encouraged the use of funding mechanisms, such as R21s, which could provide researchers an opportunity to conduct non-conventional types of research that would look at the impact that these programs that reduce poverty have on children and over the life course, perhaps.

Dr. Niolon thought Dr. Kaplan's comments about embracing the complexity of measuring community environment SDOH in the measurement of ACEs is critical and this is an area on which they had so much discussion about throughout this whole process. As Dr. Bacon mentioned earlier, they started with a big chunk of stone that they had to whittle down to have specific, concise, and overarching questions. They wanted to make sure that this point was captured, especially in the definition and measurement piece, and how understanding all of these much broader contextual factors as they related to ACEs may be more important than the individual experiences of ACEs exposures themselves and how they advance both definition and measurement in ways that can capture that. She does not think that is going to be an easy task in anyway, but she wants to make sure that these research priorities reflect their intention toward that. There probably are ways that they can be even more intentional in their language to make sure that that comes across and is captured. She welcomed thoughts and loved the ideas about innovative strategies to look at this moment in history that both COVID and the nation's response to COVID and lowering the poverty rate and changing things for this broad adversity that all of the country experienced together but differently is a real opportunity to start to examine some of these contextual factors and health and social inequities that emerged.

Dr. Bacon completely agreed and added that in terms of causal factors and larger influences that result in ACEs, ACEs are experienced by individuals but it is important to build in the appreciation for why that is. When they move into discussions about things like trauma-informed care, she wants to ensure that they are also building systems and contexts that are able to attend to the needs of individuals in various settings. There is a paradox of generating an appreciation for the social-ecological context, and she thinks there has been under-performing in that regard, while still attending to it so that it is a both/and rather than an either/or.

Dr. Lumba-Brown agreed with Dr. Kaplan's comments. Embracing complexity is key here—not easy, but key.

Dr. Maholmes indicated that they would be happy to help with this at NICHD https://www.nih.gov/echo.

Dr. Greenspan suggested considering collaboration with NCEH, given that issues like lead poisoning and environmental toxins are certainly important for inquiry. She noted that there is currently development of an Agency Climate research agenda. Mick Ballesteros is NCIPC's representative. There may be some opportunities there as well. She emphasized that this is a continuous process and that NCIPC evaluates its implementation, assesses progress toward filling gaps, and updates every 3 to 5 years.

Dr. Bonomi briefly summarized that they heard themes pertaining to the importance of weaving the concept of equity throughout the priorities, being careful with measures in that they have the potential to include biases themselves, focusing on the potential for using existing datasets to go for “low hanging fruit,” having thoughtful plans for implementation, considering alternative skeptical approaches in terms of reconsidering what we have now, and considering substance abuse in childhood as an ACE. She thanked the BSC members for their informative comments that will help this group further enhance these already amazing, excellent, outstanding work.

Public Comment Session

Victor Cabada, MPH
Office of Science
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

Mr. Cabada thanked everyone for their participation in the BSC meeting and indicated that all public comments would be included in the official record and would be posted on the CDC website with the official meeting minutes at CDC.gov/injury/bsc/meetings.html. He also indicated that while they would not address questions during this public comment period, all questions posed by members of the public would be considered by the BSC and CDC in the same manner as all other comments. He invited those who did not get a chance to speak in person to submit their comments in writing to submit written comments to ncipcbsc@cdc.gov no later than 5:00 PM to be included with the meeting minutes.

Qing Li, MD, DrPH
Epidemiologist and Former Adjunct Associate Professor, Center for Behavioral Epidemiology and Community Health
San Diego State University

This is Qing Li, an OBGYN-trained perinatal and injury epidemiologist. I have two comments. The first comment is on the importance of teen dating violence (TDV) during pregnancy. The reason I ask is that I learned it from our team manuscript under review. The title of the manuscript is, “Preventing Perinatal Teen Dating Violence through Relationship Education at Nurse Home Visiting.” This is a secondary analysis of a randomized controlled trial. The trial PI is Dr. Lynette Feder, a U49 awardee with the National Center for Injury Prevention and Control. In this U49 cooperative agreement project, Dr. Phyllis Niolon has been wonderful to help me understand the implementation of the study. She is acknowledged but not an author in the manuscript. In the United States, each year about 4 million live births are born. In 2018, 44,000 live births (1% of total births in the United States) were born by teen mothers aged 15 to 17. Those mothers have profound needs. However, our team analyzed 63 teen mothers in the manuscript under review. When I summarized the literature, only 200 teen mothers were included in intervention trials in 3 studies so far. One included 105 couples, the second 32 mothers, and our study 63 teen mothers. I hope this population can be considered due to their need for teen dating violence prevention during pregnancy which is one example of Adverse Childhood Experiences (ACEs) to two generations. The second comment is related to how we can use the research priority process on ACEs to build strategic partnerships with other federal agencies such as HRSA. HRSA was mentioned in this meeting today. The Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program from HRSA Maternal Child and Health Bureau have been invested in recently each year at $400 million. There is a profound need to understand the teen parents in HRSA programs and prevent teen dating violence through bringing in the expertise from the National Center for Injury Prevention and Control. Another

federal agency is Administration for Children and Families, which has funded the Healthy Marriage and Responsible Fatherhood Program to help youth's positive relationship development and transitions to young adulthood. I hope this strategic process at CDC can engage at least two federal partners HRSA Maternal Child and Health Bureau and ACF in this important process so we can better build capacity to address this issue teen dating violence during pregnancy together. Thank you.

Closing Comments / Adjournment

Dr. Bonomi thanked everyone for participating in this meeting and the robust discussion and reminded all BSC members and *ex officios* to send an email to Mrs. Tonia Lindley stating that they participated in this meeting. She emphasized that this meeting would not have been possible without the CDC Audio Technician, Cambridge Communications, On Par Productions, and the CDC staff, including Mrs. Tonia Lindley, Dr. Arlene Greenspan, Dr. Gwen Cattledge, and Mr. Victor Cabada. With no announcements made, further business raised, or questions/comments posed, **Dr. Bonomi** officially adjourned the open portion of the Thirty-Seventh meeting of the NCIPC BSC at 12:00 PM. She noted that BSC members and *ex officious* would reconvene at 12:50 PM EST for a secondary peer review, the closed portion of the meeting for which there would be a different Zoom link.

Certification

I hereby certify that to the best of my knowledge, the foregoing minutes of the July 29, 2021 NCIPC BSC meeting are accurate and complete:

10-15-2021
Date

Amy Bonomi, PhD, MPH
Co-Chair, NCIPC BSC

10-15-2021
Date

Chinazo O. Cunningham, M.D., M.S.
Co-Chair, NCIPC BSC

Attachment A: Meeting Attendance

NCIPC BSC Co-Chairs

Dr. Amy Bonomi, PhD, MPH
Co-Chair, NCIPC BSC
Faculty Affiliate
Harborview Injury Prevention and Research Centers
University of Washington, and Founder
Social Justice Associates

Chinazo Cunningham, MD, MS
Co-Chair, NCIPC BSC
Executive Deputy Commissioner
New York City Department of Health and Mental Hygiene

NCIPC BSC Co-Executive Secretaries

Gwendolyn Cattledge PhD, MSEH
Deputy Associate Director for Science
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

Arlene Greenspan, DrPH, MPH
Associate Director for Science
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

NCIPC BSC Members

Roger Chou, MD
Professor of Medicine, Oregon Health and Science University
Departments of Medicine, Medical Informatics and Clinical Epidemiology

Wendy Ellis DrPH, MPH
Assistant Professor, Global Health
The George Washington University
Founding Director, Center for Community Resilience

Frank A. Franklin, II, PhD, JD, MPH
Deputy Commissioner
Philadelphia Department of Public Health

Elizabeth Habermann, PhD
Professor, Department of Health Services Research
Mayo Clinic College of Medicine and Science

Mark S. Kaplan, DrPH
Professor of Social Welfare
Department of Social Welfare
Luskin School of Public Affairs

Karen D. Liller, PhD
Professor
University of South Florida College of Public Health

Angela Lumba-Brown, MD
Associate Professor, Emergency Medicine, Pediatrics, and Neurosurgery
Associate Vice Chair of Emergency Medicine
Stanford University School of Medicine
Co-Director, Stanford Brain Performance Center

Jeffrey P. Michael, EdD
Leon S. Robertson Faculty Development Chair in Injury Prevention
Visiting Scholar in the Johns Hopkins Center for Injury Research and Policy

Elizabeth Miller, MD, PhD
Professor and Chief
Children's Hospital of Pittsburgh
University of Pittsburgh Medical Center

Steve Ondersma, PhD
Clinical Psychologist and Professor
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Attachment B: Acronyms Used in this Document

Acronym	Expansion
ABCD	Adolescent Brain Cognitive Development Study
ACEs	Adverse Childhood Experiences
Add Health	National Longitudinal Study of Adolescent to Adult Health
ADS	Associate Director for Science
BSC	Board of Scientific Counselors
CBEACH	Center for Behavioral Epidemiology and Community Health
CCTI	Cambridge Communications and Training Institute
CDC	Centers for Disease Control and Prevention
COD	Causes of Death
COI	Conflict of Interest
CPSTF	Community Preventive Services Task Force
DFO	Designated Federal Official
DVP	Division of Violence Prevention
ERPO	Extramural Research Program Office
ET	Eastern Time
FACA	Federal Advisory Committee Act
FOA	Funding Opportunity Announcement
HBCD	HEALthy Brain and Child Development Study
HHS	(Department) Health and Human Services
HRSA	Health Resources and Services Administration
IPV	Intimate Partner Violence
LGBTQ	Lesbian, Gay, Bisexual, Transgender, Queer/Questioning
NCEH	National Center for Environmental Health
NCIPC / Injury Center	National Center for Injury Prevention and Control
NICHD	National Institute of Child Health and Human Development
NIDA	National Institute on Drug Abuse
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institutes of Health
NLSY	National Longitudinal Survey of Youth
NOFO	Notice of Funding Opportunity
OPP	On Par Production
OSI	Office of Strategy and Innovation
OWG	Opioid Workgroup
PCEs	Positive Childhood Experiences
RCT	Randomized Controlled Trial
SDOH	Social Determinants of Health
TDV	Teen Dating Violence
US	United States
USPSTF	United States Preventive Services Task Force

Attachment C: References Proposed ACEs Priorities

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Attachment D: Chat Box Comments

Amy Bonomi (09:44 AM) Good morning, everyone. Hope your day is going well, so far. Looking forward to our meeting.

Liz Miller (10:02 AM) I am unable to unmute. Present no conflicts.

Liz Miller (10:03 AM) I switched computers.

Angela Lumba-Brown (11:05 AM) Discussion format may be better supported in the future to end the presentation slide at the termination of presentation and enable switching to a true gallery view.

Valerie Maholmes (11:20 AM) Yes. We would be happy to help with this at NICHD.

Arlene Greenspan (11:21 AM) May want to consider collaboration with NCEH, issues like lead poisoning and environmental toxins are certainly important for inquiry.

Valerie Maholmes (11:23 AM) https://www.nih.gov/echo

Arlene Greenspan (11:23 AM) There is currently development of an Agency Climate research agenda. Mick Ballesteros is our representative. There may be some opportunities there as well.

Sarah Bacon (11:24 AM) Thanks to those offering comments here, too. Just want to confirm that we are seeing them and will attend to them!

Arlene Greenspan (11:29 AM) Just to add that this is a continuous process and that we evaluate our implementation, assess progress toward filling gaps and update every 3 to 5 years.

Wendy Ellis (11:37 AM) Our measurement research needs to inform how community and environmental factors can prevent or exacerbate ACEs. This will be crucial in making a quantitative case for equity.

Phyllis Niolon (11:40 AM) No, I missed a little of it struggling to understand question. Apologies to all—my internet cut out and I missed a little of Dr. Liller's question and was trying to catch up.

Sarah Bacon (11:40 AM) Thanks to of you for engaging in such a helpful discussion!

Phyllis Niolon (11:42 AM) Wendy, completely agree with your last comment in the chat and I have some thoughts about how we can make some of the language in the bullet about measurement on social and health inequities and community environments more specific to highlight your point.

Angela Lumba-Brown (11:51 AM) Thank you. I had already shared my comment and question. Nothing further from me. I applaud and agree with Mark's comments. Embracing complexity is key here, not easy, but key.

Liz Miller (11:51 AM) I appreciate Dr. Kaplan's comments about some exploratory funding opportunities as well (similar to the R21 at NIH).

Angela Lumba-Brown (11:56 AM) Thank you for an important presentation and thoughtful discussion.

Derrick Gervin (11:56 AM) Thank you!

Phyllis Niolon (11:57 AM) Thank you to all for a great discussion.