The Data behind Adverse Childhood Experiences (ACEs) and Resilience

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Child and Adolescent Health Measurement Initiative
Prioritizing Possibilities for Population Health and Well Being

The Problem of Adverse Childhood Experiences and the Promise of Prevention, Resilience and Healing
Well-being is Upon Us
(and within and between us)

When our science, lived experience and policies meet

Ours is a social brain.
Knowledge about brain plasticity, epigenetics and social determinants of health make healing developmental trauma and relationships a matter of public health.

Source: Bethell, C 2016
If regulation requires connection—what does “self-regulation” mean?

Source: Bethell, C. 2016
Maslow Rewired: The primacy of safe, stable, nurturing relationships to physical and mental health throughout life

Source: Bethell, C 2016
PUBLIC HEALTH HAS NO BOUNDARIES

The air we breathe. The food we eat. Public health impacts us all.

We protect health. We save lives. So can you.
When a baby feels safe, they explore and if a baby explores, they learn.
"Adverse childhood experiences" has become a buzzword in social services, public health, education, juvenile justice, mental health, pediatrics, criminal justice, medical research and even business. The ACE Study -- the CDC's Adverse Childhood Experiences Study -- has recently been featured in the New York Times, This American Life, and Salon.com. Many people say that just as you should what your cholesterol score is, so you should know your ACE score. But what is this study? And do you know your own ACE score?

Source: Bethell, C 2016
ACEs Impact Multiple Outcomes

ACEs

Risk Factors for Common Diseases
- Smoking
- Alcoholism
- Promiscuity
- High Perceived Risk of HIV
- Poor Perceived Health
- Multiple Somatic Symptoms
- Obesity
- Illicit Drugs
- IV Drugs

Prevalent Diseases
- Cancer
- Liver Disease
- Chronic Lung Disease
- Skeletal Fractures
- Ischemic Heart Disease

General Health and Social Functioning
- Relationship Problems
- Married to an Alcoholic
- High perceived stress
- Difficulty in job performance

Mental Health
- Depression
- Anxiety
- Panic Reactions
- Memory Disturbances
- Poor Self-Rated Health

Sexual Health
- Teen Paternity
- Teen Pregnancy
- Fetal Death
- Unintended Pregnancy
- Sexual Dissatisfaction

Sexually Transmitted Diseases
- HIV
- Ischemic Heart Disease
- Ischemic Heart Disease

Early Age of First Intercourse
- Poor Anger Control
Figure 16: Population Attributable Risk

- **ACEs**: Disturbed 14+ Days of Work / Activity
- **Mental Health Condition(s)**
- **HIV, High Risk**
- **Anxiety**
- **Alcohol, Heavy Drinking**
- **Cardiovascular Disease**
- **Cancer**
- **Separation or Divorce**
- **Life dissatisfaction**
- **Mental Health Treatment or Pharmacotherapy**

Sources:
Making data accessible to all. It’s your data…your story!
Prevalence Among US Children
(2011-12 National Survey of Children’s Health)

Prevalence of 2+ (of 9) ACES:
16.3% (UT) – 32.9% (OK)


Source: Bethell, C 2016
Prevalence of ACEs Among Young Children, Age 0-5 Years
Data: 2011-12 National Survey of Children’s Health (NSCH)

Prevalence of 2+ (of 9 items) ACEs
State Range: 7.3% (CA) – 20.1% (KY)
Nearly half of US children have had at least one of 9 ACEs – an estimated 34.8 million children nationwide

<table>
<thead>
<tr>
<th></th>
<th>Nation</th>
<th>1+ Other ACE</th>
<th>State Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child had ≥ 1 ACEs</td>
<td>47.9%</td>
<td>NA</td>
<td>40.6% (CT) - 57.5% (AZ)⁵</td>
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<tr>
<td>Extreme economic hardship</td>
<td></td>
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<tr>
<td>Family discord leading to divorce or separation</td>
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<td>20.1% (DC) - 29.5% (OK)</td>
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<tr>
<td>Has lived with someone who had an alcohol/drug problem</td>
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<td>10.7% (NY) - 18.5% (MT)</td>
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<td>Has been a victim or witness of neighborhood violence</td>
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<td>8.6% (NJ) - 16.6% (DC)</td>
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<tr>
<td>Witnessed domestic violence</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Parent served time in jail</td>
<td></td>
<td></td>
<td>6.9% (NJ) - 13.2% (KY)</td>
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<tr>
<td>Treated or judged unfairly due to race/ethnicity</td>
<td>4.1%</td>
<td>70.3%</td>
<td>1.8% (VT) - 6.5% (AZ)</td>
</tr>
<tr>
<td>Death of parent</td>
<td>3.1%</td>
<td>74.3%</td>
<td>1.4% (CT) - 7.1% (DC)</td>
</tr>
</tbody>
</table>


The validity and value of ACEs as a predictive measure of cumulative risk

< 1% missing values in NSCH
No drop off in survey response

Multiple ACEs Common

>90% 2+ (alcohol/drugs; domestic violence; jail)
>80% 2+ (mentally ill; neighborhood violence)
>70% 2+ (divorce; discrimination; death)
>50% 2+ (economic hardship)

Source: Bethell, C 2016
Prevalence of Adverse Child and Family Experiences, by Age Groups, Household Income Level and Child Race/Ethnicity

Source: Bethell, C 2016

Prevalence of Adverse Child and Family Experiences

- **0-5 years**
  - Two or more adverse family experiences: 12.5%
  - One adverse family experience: 24.1%

- **6-11 years**
  - Two or more adverse family experiences: 24.4%
  - One adverse family experience: 25.8%

- **12-17 years**
  - Two or more adverse family experiences: 30.5%
  - One adverse family experience: 26.0%

- **0-99% FPL**
  - Two or more adverse family experiences: 34.8%
  - One adverse family experience: 31.8%

- **100-199% FPL**
  - Two or more adverse family experiences: 28.6%
  - One adverse family experience: 30.4%

- **200-399% FPL**
  - Two or more adverse family experiences: 21.0%
  - One adverse family experience: 24.1%

- **400% FPL or more**
  - Two or more adverse family experiences: 9.6%
  - One adverse family experience: 17.4%

- **Hispanic**
  - Two or more adverse family experiences: 21.8%
  - One adverse family experience: 29.1%

- **White, non-Hispanic**
  - Two or more adverse family experiences: 21.0%
  - One adverse family experience: 23.3%

- **Black, non-Hispanic**
  - Two or more adverse family experiences: 31.1%
  - One adverse family experience: 29.3%

- **Other, non-Hispanic**
  - Two or more adverse family experiences: 22.2%
  - One adverse family experience: 22.2%

Source: Bethell, C 2016
Equally Unequal: Similarities of Impact Across Income Groups

Prevalence of Emotional, Behavioral or Developmental Problems Among Children with 4+ ACEs: By Household Income

Rich or poor
The withholding of love Pierces
May you be led to the mysterious transfiguration this piercing can allow
And open to the truth from within like the nautilus closing off all former layers
And slowly, patiently rising up into the love that always was
Mirrored or not Always was Always will be

Excerpt from “Breaking Ground” Christina Bethell

Source: Bethell, C 2016
Impacts on Chronic Condition Status Appear early in Life

Chronic Condition Requiring Above Routine Health Care

- No ACEs: 14.60%
- 1 ACE: 20.30%
- 2+ ACEs: 31.60%

AOR: 0.68 (p-value)
AOR: 0.44 (p-value)

Source: Bethell, C 2016
Prevalence and Adjusted Odds Ratio of EMB Conditions, by ACEs Status and Age

Data: 2011-12 NSCH

Rate Ratio of EMB Prevalence:
No ACEs vs 1, 2-3 or 4+ ACEs:
- All children: 1.65-4.71
- 2-5 years: 1.97-6.59
- 6-11 years: 1.44-4.00
- 12-17 years: 1.60-3.58

AOR: Reference
- All children: 1.44-1.85
- 2-5 years: 2.44-3.13
- 6-11 years: 4.71-6.59
- 12-17 years: 37.0%

AOR: Adjusted odds ratio: adjusted for, sex, race/ethnicity, income, insurance status; All AORs are statistically significant at p≤.5.

Nearly half (45.7%) of all US children age 4 months – 5 years at HIGH or MODERATE risk for developmental, behavioral or social problems have had ACEs—a risk for trauma and high persistent stress and the neuro-endocrine-immune effects that threaten resilience and positive health.
Prevalence of Children at High Risk for developmental, behavioral or social delay, by ACEs Items

Data: 2011-12 NSCH

- Child lived in families often hard to get by on family's income: 8.9% (ACE), 16.3% (No ACE)
- Child lived with parent who got divorced/separated: 10.4% (ACE), 14.9% (No ACE)
- Child lived with parent who died: 10.8% (ACE), 14.9% (No ACE)
- Child lived with parent who served time in jail: 10.7% (ACE), 14.7% (No ACE)
- Child saw parents hit, kip, slap, punch or beat each other up: 10.6% (ACE), 16.9% (No ACE)
- Child was a victim of violence or witness violence in neighborhood: 10.5% (ACE), 16.9% (No ACE)
- Child lived with anyone who was mentally ill/suicidal/severity depressed: 10.5% (ACE), 16.9% (No ACE)
- Child lived with anyone who had a problem with alcohol or drugs: 10.5% (ACE), 16.2% (No ACE)
- Child was ever treated or judged unfairly because of race or ethnic group: 10.7% (ACE), 22.8% (No ACE)
Maternal Health and Child Health

Proportion of Children With Mother’s In Excellent or Very Good Physical and Mental Health: By ACEs Status

Source: Bethell, C 2016
Flourishing and Adverse Childhood Experiences
(US Children Age 6-17)

Flourishing (based on factors possible for parents to observe):
1. **Motivation**: Curious and interested in learning new things
2. **Resilience**: Stays calm and in control when faced with a challenge
3. **Attention**: Follows through and finishes tasks

Source: Bethell, C 2016
Shining a light on ACEs is more than a “Courtesy Alert”

“In my beginning is my end.” (?)  
T.S. Eliot, *Four Quartets*

“Where you stumble, there your treasure lies”  
Joseph Campbell
Developmental Trauma Disorder (DTD)

National Traumatic Stress Network suggests that DTD is indicated with:

(1) dysregulation of a child’s stress response, as exhibited by symptoms, behaviors and, potentially, biologic measurements; (often categorized as mental health diagnoses now)
(2) internalized negative attributions and diminished hope and expectations for life;
(3) difficulty with self-esteem regulation; and
(4) functional impairments in key areas such as making social connections, participating in school, etc.
ACEs and Toxic Stress: Impact Pathways

"You can go good places with your mind if you can’t go good places with your body."
Stephen Porges, PhD
Professor Emeritus, University of Illinois at Chicago. Director, Brain Body Center in the Department of Psychiatry. Author: The Polyvagal Theory

Source: Bethell, C 2016
The promise of prevention, resilience and healing
Prevalence of emotional, mental or behavioral conditions by adverse childhood experiences (ACEs) and resilience status (all US children ages 6-17). Data: 2011-12 NSCH

- No ACEs: 6.4% (AOR: 4.02, *RR: 3.11)
- 1 ACE: 8.4% (AOR: 4.61, *RR: 3.35)
- 2+ ACEs: 16.1% (AOR: 3.79, *RR: 2.64)

*RR: 2.64
AOR: 4.02


Source: Bethell, C 2016
School Engagement Rate Among Children With Special Health Care Needs Exposed to 2+ Adverse Childhood Experiences: By Demonstration of Resilience

Adjusted Odds Ratios (controlling for household income, race/ethnicity, insurance adequacy and sex)

Source: Bethell, C 2016
Prevalence of resilience among US children age 2-17 with emotional, mental or behavioral conditions (EMB) and 2 or more adverse childhood experiences (ACEs) exposures: by key protective factors (Data: 2011-12 NSCH)

- Adult mentor: Prevalence of child resilience when result is YES: 32.7%, when result is NO: 17.9%.
- Share about things that matter: Prevalence of child resilience when result is YES: 40.6%, when result is NO: 20.9%.
- Parent reports above average aggravation: Prevalence of child resilience when result is YES: 38.3%.

*RR: 1.63
*RR: 1.94
*RR: 1.78

Source: Bethell, C 2016
Building Core Capabilities for Life

The Science Behind the Skills Adults Need to Succeed in Parenting and in the Workplace

How Our Core Capabilities Work

**Automatic Self-Regulation**
- Rapid, impulse-directed
- “Fight or flight” response
- Important for urgent situations

**Intentional Self-Regulation**
- Conscious, planful, proactive
- Inhibits automatic responses
- Important for achieving goals

Attention
- Attention is the critical gatekeeper that's needed to engage intentional self-regulation.

Executive Function
1. Inhibitory Control
2. Working Memory
3. Mental Flexibility

Essential capabilities such as planning, focus, and self-control are all orchestrated by the balance of two kinds of self-regulation mechanisms: **automatic** and **intentional**. The proper balance ensures appropriately responsive and productive actions.
Fundamentals of Safe, Stable, Nurturing Relationships (SSNRs) for Children and Adults: Serve and Return and SCARF

Young children can not go away from threat

I matter
I know
I choose
I connect
I trust
Parenting Programs and Trauma Healing Approaches Promote Practices that Develop and Restore Pre-Frontal Brain Functions and Mind-Body Integration

- Bodily Regulation
- Attuned Communication
- Emotional Balance
- Fear Extinction
- Flexibility
- Insight
- Empathy
- Morality
- Intuition

Not only is mindfulness an antidote to stress and capable of improving our emotional and physical well being, research studies indicate it improves our memory, learning, concentration, coherence and creativity.

— Yale Research/The Week Health and Science Section

Source: Bethell, C 2016
Inspire to rewire…the brain can grow and change!

• Neuroplasticity is best encapsulated in Canadian psychologist Donald Hebb’s famous quote, “neurons that fire together wire together.”

• The big implication here is that if our brain changes itself based on our experiences, then by changing our experiences we can actively reshape our brains.

• One way to consciously change our experience is to learn to be intentionally aware of our experience as it is unfolding and to exercise conscious choice and intention in an open, caring and nonjudgmental way.

• Most Recent Research: Around 86 Billion Neurons

• Trillions of synaptic connections

• Neuroimaging shows mindfulness-related practices promote significant changes in the brain.

Source: Bethell, C 2016
Moving from the back seat to the driver’s seat

Moving to the hub of the mind

“Pixar’s latest effortlessly conveys the idea that its hero is both the sum of her emotions and somehow independent of them.”
EPIGENETICS AND TRAUMA INTERRUPTED!
Self-Awareness, Stress Regulation and Promoting Positive Emotions

Personalized Medicine Universe

Mind-body medicine: Effect of the mind on gene expression

By Roseanne Zhao, Ph.D.
NiH Medical Scientist Training Program Track 3 Scholar

Child abuse leaves epigenetic marks

Child abuse is a serious national issue. Each year, more than 1.25 million

DOI: http://dx.doi.org/10.1001/2012.05.001

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Published Online: June 22, 2012
Accepted: march 8, 2012
Received: February 28, 2012

Source: Bethell, C 2016
New UK “texting” fad: .b

Short for: “stop, breath, trust, choose—moment-by-moment”
Are We Suffering from a Societal Level “Hard-Easy” Cognitive Bias?

The healing power of a coherent narrative – also strongest predictor of healthy mother-child attachment

The transformative power of growth mindset – adopting a developmental orientation toward self and life

There is no greater agony than bearing an untold story inside you

Maya Angelou
Relationships At the Core of Adaptive Systems: (Masten, ‘14)

**Relationships**
- Safe, stable, nurturing
- Effective parents and caregivers
- Connections to other competent and caring adults

**Child**
- Awareness of sensations, feelings, meaning; self-soothing
- Problem solving skills; resourceful;
- Positive beliefs about self
- Beliefs that life has meaning; goals
  -- Spirituality and faith; hope

**Community & Environment**
- Socioeconomic sufficiency
- Pro-social culture and peers
- Effective teachers/schools
- Safety and trust
- Collective efficacy and capacity for problem solving

Source: Bethell, C 2016
Integrating a Trauma Informed Approach With an Explicit Focus on Restoring Relatedness, Connection and Nurturance

- Realizes: the widespread impact of trauma and understands potential paths for recovery
- Recognizes: the signs and symptoms of trauma in clients, families, staff, and others
- Responds: by fully integrating knowledge about trauma into policies, procedures, and practices
- Resists: re-traumatization by fully integrating knowledge about trauma into policies, procedures, and practices

Implementing trauma informed principles represents a *We Are the Medicine* paradigm shift.

Relational wounding requires relational healing.

Source: Substance Abuse Mental Health Services Administration, National Center for Trauma-Informed Care (http://www.samhsa.gov/nctic/trauma-interventions)

Source: Bethell, C 2016
**Priorities:** Most common priorities reported by parents during their children’s 6 years routine visit

<table>
<thead>
<tr>
<th>All children</th>
<th>CSHCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Helping your child express feelings and control behaviors (39.9%)</td>
<td>1. Helping your child express feelings and control behaviors (40.0%)</td>
</tr>
<tr>
<td>2. Teaching your child to make healthy food choices (29.8%)</td>
<td>2. Succeeding in social situations (25.0%)</td>
</tr>
<tr>
<td>3. Succeeding in social situations (28.6%)</td>
<td>3. Healthy weight for your child (25.0%)</td>
</tr>
<tr>
<td>4. Helping your child make good decisions and gain independence (26.2%)</td>
<td>4. Helping your child make good decisions and gain independence (25.0%)</td>
</tr>
<tr>
<td>5. Continuing to improve in listening, reading, and math (23.8%)</td>
<td>5. Deciding if your child needs more help (22.5%)</td>
</tr>
</tbody>
</table>
Nearly 50 Years of Research Linking Well-Being to Safe, Stable, Nurturing Relationships and Stress

1968
Herbert Benson of Harvard University publishes *The Relaxation Response*

1975
John Bowlby publishes *Attachment and Loss*

1976
Norman Cousins (UCLA) publishes *Anatomy of an Illness* in the NEJM

1978
Richard Davidson publishes first neuroscience paper evaluating the effects of meditation on brain physiology and attentional and affective capacities.

1986
David Barker publishes landmark research and theories on the fetal and early life origins of health and adult disease, launching a now vital new field of study on the developmental origins of health and adult disease (DOHaD).

1990
Jon Kabat-Zinn publishes bestselling *Full Catastrophe Living* -- the first textbook describing mechanisms of stress on the body-mind and role of mindfulness-based stress reduction approaches to reduce pain and improve mental and physical health.

1996
Former JHU NIMH scientist central to Nobel Prize winning discovery of the opioid receptor site publishes *Molecules of Emotion* documenting the molecular underpinnings of the mind-body connection.

1998
Daniel Siegel publishes *The Developing Mind* textbook that integrates multiple streams of neuroscience, biologic and human development sciences into a coordinated theory called Interpersonal Neurobiology.

1999
The Institute of Medicine/National Academy of Sciences releases *Neurons to Neighborhoods*.

Source: Bethell, C 2016
Nearly 50 Years of Research Linking Well-Being to Safe, Stable, Nurturing Relationships and Stress

2010
- The World Health Organization World Mental Health Survey Initiative documents impact of ACEs and other adversities across 21 countries, finding similar results as the CDC/Kaiser ACE study.

2011
- The National Survey of Children’s Health includes questions about ACEs and resilience, providing first ever population based data for all US children, youth and families.

2012
- The American Academy of Pediatrics Issues is first policy statement to pediatricians explaining and advancing the science and practice of preventing and addressing early childhood stress and trauma.

2013-2015
- Numerous high profile studies published linking early childhood investments to adult health

2016
- The American Academy of Pediatrics will publish its first policy statement to US pediatricians on the use of mind-body methods to improve health of children and youth.

Exponential uptake of ACEs Study and other accumulated findings lead to national, state, local and international efforts that include paradigm shifting “trauma-informed” initiatives that incorporate mindfulness-based approaches in schools, policing, medicine, social work, community, city and public health.

Source: Bethell, C 2016
We Know Much—Time for Translation
Transformational Translation Using Citizen Science

Concept: Establish a platform to engage individuals and families in rapid cycle, personalized learning to deliver on the promise of prevention and human development sciences to transform well-being for generations to come.

• Inspiring Agenda
• Engaging Engagement Opportunities ("Room to Attune", "The New Pub") that meet people where they are
• Transformative Translation: shared mindsets and metrics; continuous synthesis, citizen scientist forums and razor sharp change targets;
• Transparent Communication: Leveraging existing and citizen-driven communication vehicles
Example: Empowering a Family-Centered Cycle of Engagement

**WELL VISIT PLANNER (WVP)**

- Enhance pre-visit planning and education
- Improve parent-provider communication and quality of care
- Enhance parent activation

**Pre-Encounter**
- Understand purpose of visit
- Identify concerns and priorities
- Learn about child’s development

**The Encounter**
- Focus on parent priorities
- Discuss family environment
- Address developmental, behavioral and emotional concerns
- Targeted education

**Post-Encounter**
- Improved self-care
- Use community resources
- Awareness and prevention
- Support for development
- Informed decisions

**PROMOTING HEALTHY DEVELOPMENT SURVEY (PHDS)**

- Customized feedback report, educational resources, and guidance for next visit
- Support provider understanding of parent priorities and needs
- Enhance patient and provider activation

**PDSA Cycle for Quality Improvement**

- Plan
- Do
- Study
- Act
Free Our Brilliance (Align Values and Rewards)

Take on Transparency (Turn on the Learning System)

Catalyzing a “We are the Medicine” Paradigm Shift

Become “We Ninjas”
Activate the Affiliative System & Restore Relatedness

Prioritize Possibility (Amplify Positive Experiences & Instill a Habit of Hope)

Take on Trauma (From Fixing to Connecting Practices- *Triple T*: Time In, Time With, Time For)

Brave Being (Your Being, Their Well-Being; Activate “The Presence Effect”)

Six Wishes
Mindsets to match the mandate

Metrics to match the mindset

Methods to move the metrics

The New Science of Thriving

Our well-being—individually and as a society—depends on mindfulness.

Story by Christina Bethell • Illustrations by Joel Nakamura

Source: Bethell, C 2016
Promoting early and lifelong health leveraging prevention and human development sciences.
We Are the Medicine

Healing is Upon Us!
(and within and between us!)

Source: Bethell, C 2016
ADVERSE CHILDHOOD EXPERIENCES

AWARENESS TO ACTION

2016 CONFERENCE | OCTOBER 19-21

PEDIATRIC SYMPOSIUM

OCTOBER 20
To Beauty

….and the translation of the science and practice of promoting **positive health and healing** for children, youth and families.
### New Science of Thriving: Design Concepts

- Concerns itself with the **capacity** for positive human development even in the face of adversity.
- Frames well-being as a **learned** ability.
- Places the **locus** of human health and dynamics of development within the social, emotional, and environmental context we co-create.
- Balances conventional focus on negative development, risk factors and pathology with an explicit **focus on strengths and what is already whole**.
- Innovates to **engage** largely untapped capacities for self-led healing, resilience and well-being at the individual, family, community and societal levels.
- Focuses on the **social and emotional skills** central to preventing interpersonal harm, poor self-care behaviors and essential to enhance self-healing, resilience, and higher consciousness.