



Adverse Childhood Experiences

Ann Bullock, MD
Director

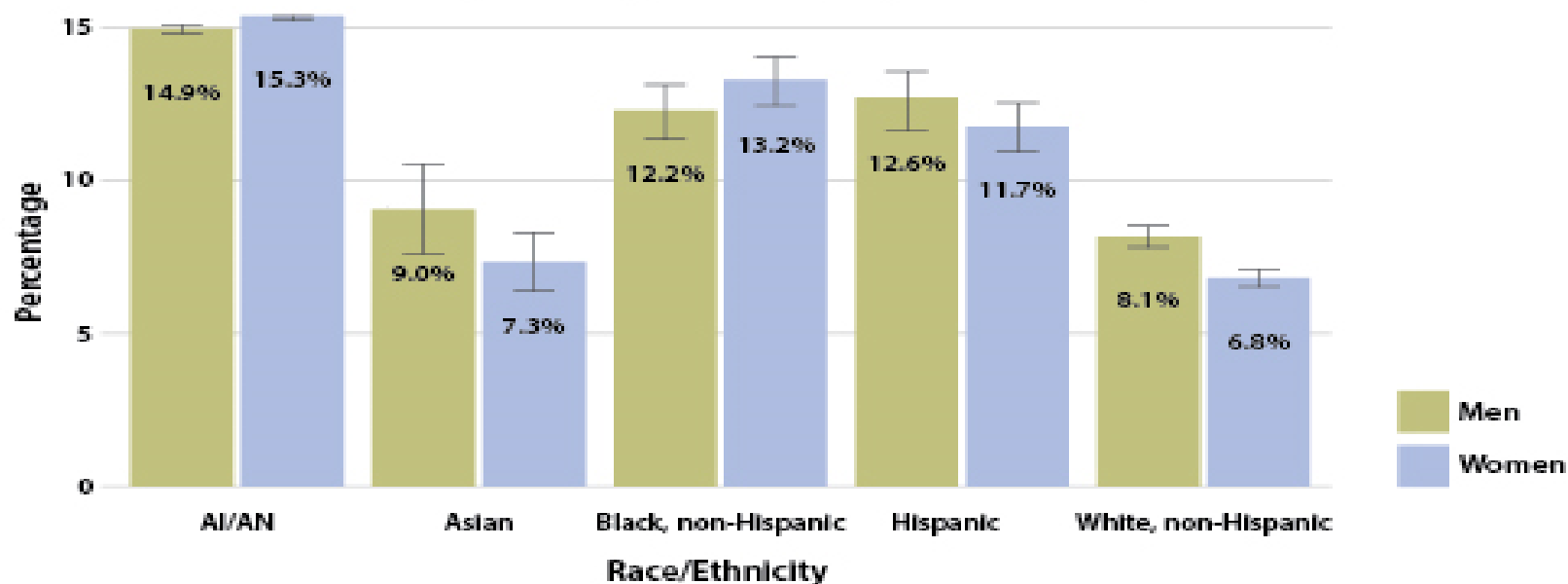
Division of Diabetes Treatment and Prevention

Indian Health Service
Division of Diabetes Treatment and Prevention



CDC National Diabetes Statistics Report, 2017

Estimated age-adjusted prevalence of diagnosed diabetes by race/ethnicity and sex among adults aged ≥ 18 years, United States, 2013–2015



AI/AN = American Indian/Alaska Native.

Note: Error bars represent upper and lower bounds of the 95% confidence interval.

Data source: 2013–2015 National Health Interview Survey, except American Indian/Alaska Native data, which are from the 2015 Indian Health Service National Data Warehouse.

Larger Context of Diabetes

- In 1997, diabetes was thought to be caused by genetics and lifestyle choices
- We now know that model needs to be expanded!
 - It does matter what genes we inherit
 - But proportion of predisposition explained by genes for type 2 DM (5-10%) is fairly small *NEJM 2010;363:2339-50*
 - And genes which are associated with ↑ diabetes risk are as common in non-minority as in minority people *Diabetes Care 2012;35:193 -195*
- It turns out that the roots of diabetes are very similar to those for other significant problems in our communities
 - Including heart disease, depression, school problems, substance abuse, domestic violence

Stress and Diabetes Risk

- Study in 18,000 adults: dose-response association between the number of risk factors and onset of diabetes over the next 3½ years:
 - < High school education
 - Financial worry
 - Being single or separated
 - High stress
 - Intimate partner violence
 - Concentrated neighborhood poverty
 - Depressive symptoms
 - Smoking

JAMA Network Open 2019;2(5):e193933

Food Insecurity

- 42% of households below poverty level are food insecure
 - as are 21% of all households with children *NEJM 2010;363:6-9*
- Prevalence of food insecurity in AI/AN households is very high
 - 61% in one study in families with young children *BMC Public Health 2017;17:611*
- Food insecurity more than doubles the risk of developing diabetes
PLoS ONE 2018;13(5):e0195962
- ↑ Risk for poor blood sugar control
Diabetes Care 2012;35:233-238
- Diet *quality* associated with weight gain even if calories restricted
JAMA 2014;311(21):2167-2168



“...many adult diseases should be viewed as developmental disorders that begin early in life and

...persistent health disparities associated with poverty, discrimination, or maltreatment could be reduced by the alleviation of toxic stress in childhood.”

American Academy of Pediatrics

“The Lifelong Effects of Early Childhood Adversity and Toxic Stress”

Pediatrics 2012;129:e232-e246

Trauma

- **Trauma:** anything that *overwhelms* our ability to respond, especially if we perceive that our life or our connection to things that support us physically or emotionally is threatened
 - Can cause lasting changes in the brain and body that increase risk for many problems
 - Any later experiences which remind the brain of prior trauma, can trigger same physical and emotional responses as at time of original trauma
- **When trauma occurs during *development* of brain and body systems, can have lifelong impact**
 - **Toxic stress:** when a child experiences *strong, frequent, and/or prolonged adversity*—such as physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family economic hardship—*without adequate adult support*.
Harvard Center on the Developing Child
- **Adverse Childhood Experiences (ACE):** abuse, neglect, and/or household dysfunction experienced in childhood
 - Increase risk at any level: graded, dose-response relationship

Adverse Childhood Experiences (ACEs)

- Physical Abuse
 - Emotional Abuse
 - Sexual Abuse
 - Family Substance Abuse
 - Family Mental Illness
 - Incarcerated Family Member
 - Parental Separation/Divorce
 - Seeing Mother Physically Abused
 - Physical Neglect
 - Emotional Neglect
- ACE “score” = number of *categories* experienced before age 18 yrs

ACES can have lasting effects on....



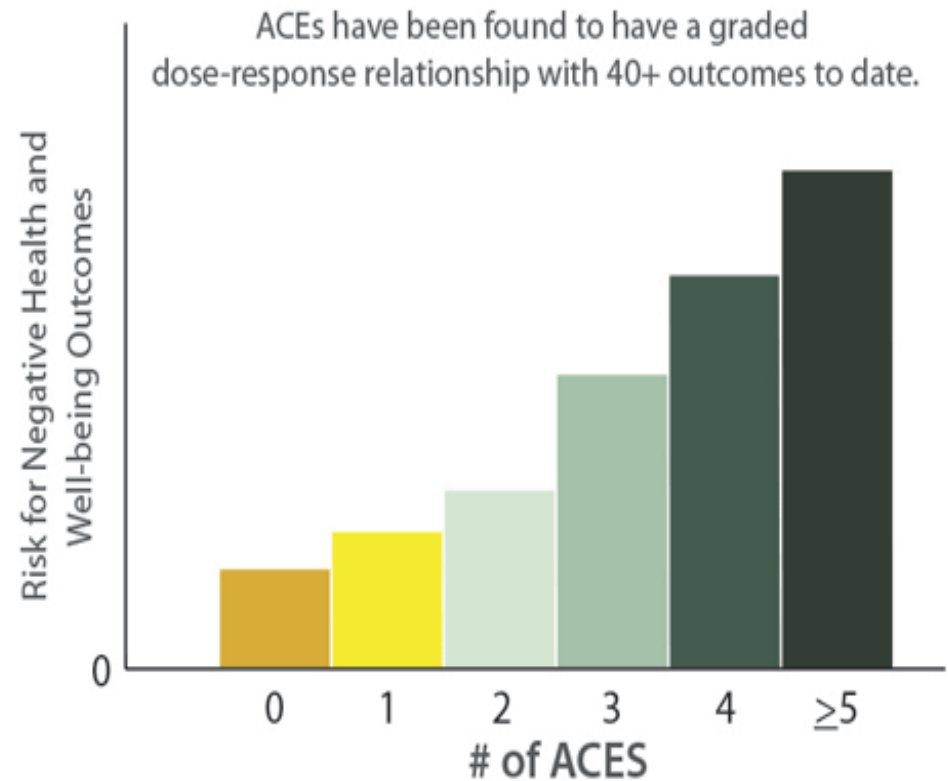
Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)



Behaviors (smoking, alcoholism, drug use)



Life Potential (graduation rates, academic achievement, lost time from work)



*This pattern holds for the 40+ outcomes, but the exact risk values vary depending on the outcome.

ACEs and Adult Health

- **ACE Score ≥ 4**

- 4-12 x risk for alcoholism, drug abuse, depression and suicide attempt
- 2-4 x risk for smoking, teen pregnancy, multiple sexual partners
- 1.4-1.6 x risk for severe obesity
- **Strong graded relationship at all levels of ACEs for almost all outcomes, including heart disease**

Am J Prev Med 1998;14:245-258 and Circulation 2004;110:1761-6

- As one person said of herself:

- Being 300 pounds and smoking 3 packs/day isn't the problem—they're the symptoms

ACEs and Diabetes/Heart Disease

- Whitehall Study: Every additional ACE ↑'d likelihood of developing diabetes by 11%
Diabetes Care 2018;41:2120-2126
- Across 10 countries, adults who experienced ≥ 3 childhood adversities:
 - Hazard ratios 1.59 for diabetes, 2.19 for heart disease
 - Risk is similar to the association between cholesterol and heart disease
Arch Gen Psych 2011;68:838-844
- Behavioral Risk Factor Surveillance System (BRFSS): > 45,000 participants
 - ACE prevalence was high: 52% reported ≥ 1 ACE, 25% reported ≥ 2 ACEs
 - Risk for diabetes, hypertension, and dyslipidemia ↑'d in a dose-response relationship to ACEs
 - ACEs increased risk *independently* of their effect on unhealthy behaviors
Am J Med 2019;132:605-613

ACEs in AI/AN Children

National Survey of Children's Health

- 1,453 AI/AN children aged 0-17 yrs compared with 61,381 white children from the 2011-2012 Survey
- AI/AN children were more likely to have experienced:
 - 2+ ACEs (40.3% vs. 21%)
 - 3+ ACEs (26.8% vs. 11.5%)
 - 4+ ACEs (16.8% vs. 6.2%)
 - 5+ ACEs (9.9% vs. 3.3%)
- AI/AN kids with 3+ ACEs compared with AI/AN with < 2 ACEs
 - Prevalence of depression, anxiety, ADHD 14.4%, 7.7%, 12.5% vs. 0.4%, 1.8%, 5.5%
 - School problems, grade failures, need for medication and counseling were 2-3x higher

Scientifica 2016; Article ID 7424239

Prenatal Risk Factors

- High levels of racial inequality and socioeconomic inequality increase the risk of SGA birth, particularly when they co-occur.
Am J Public Health 2015;105:1681–1688
- Maternal stressful life events during 1st trimester ↑ risk of preterm birth (OR 2.4)
Am J Obstet Gynecol 2010;203:34.e1-8
- **Being born early and/or small are *strongly* associated with later risk for diabetes and heart disease**
Diabetes 2009;58:523-526

“Early experiences and life circumstances shape prenatal and early childhood development, with powerful impacts on the developing brain and body that shape health outcomes across the life course and can span generations.”

[“Vibrant and Healthy Kids: Aligning Science, Practice, and Policy to Advance Health Equity”](#)

Consensus Study Report Highlights
National Academy of Sciences, 2019

Indian Health Service
Division of Diabetes Treatment and Prevention

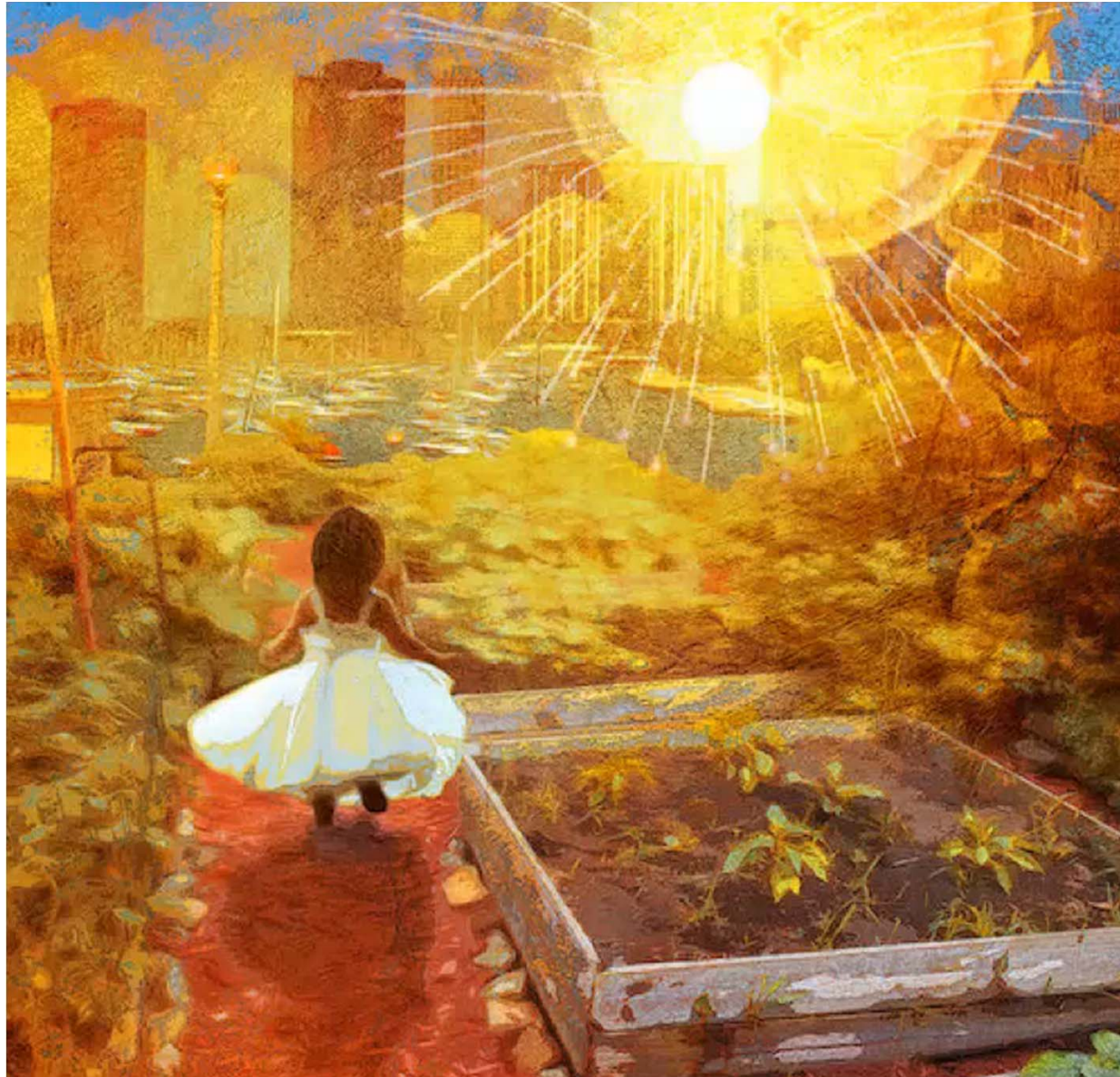
The National Academies of
SCIENCES • ENGINEERING • MEDICINE

CONSENSUS STUDY REPORT



Vibrant and Healthy Kids

ALIGNING SCIENCE, PRACTICE, AND POLICY
TO ADVANCE HEALTH EQUITY



What to do?





What is “trauma-informed”?

- Changing the “lens” through which we see people and the problems in our communities:
 - From: “What’s *wrong* with you?”
 - To: “What’s *happened* to you?”
 - This includes how we see *ourselves*
- Which changes the way we support and interact with the people we serve
- And then we change the services and programs in our communities
- How do we start? How do we communicate this to our colleagues and communities?



Step 1

- **Understand how stress and trauma work**
 - Health, mental health, social service, law enforcement all need to **really** understand them
 - When we do, it changes everything about how we see the clients we work with
 - And how we see ourselves and our responses
 - Moving from “What’s wrong with you?” to “What’s happened to you?” **shifts our focus from “blame” to compassion—and action**

Film clip from “Resilience”



Step 2

- **Make no/low cost changes in your current system, such as:**
 - Physical environment
 - Appointment policies
 - Screen for food insecurity and connect clients to food resources
 - Screening tool on ihs.gov/diabetes
 - Enhanced care management

“Paper Tigers” trailer

Where to Get Food Assistance in This Community

Community Name: _____ Date: _____

Not having enough food for yourself and your family is stressful. Lack of good food makes it difficult to provide nutritious meals that help children grow and adults stay healthy. The thought of not having enough food can make you worry. There are resources to help. If you need food assistance, please don't wait to contact the programs on this list. They can help you get the food you need for yourself and your family.*

Program Name	Contact Name	Contact Number	Other Important Information (Location, Who Can Qualify, Hours, etc.)
SNAP - Supplemental Nutrition Assistance (Food Stamps)			
Food Distribution (Commodities)			
Women, Infants, and Children (WIC)			
School Lunch and Breakfast Program			
Summer Food Service Program for Children			
Senior Center			
Meals on Wheels			
Tribal Food Program			
Farmers Markets			
Community Gardens			
Food Bank / Food Pantry			
Mobile Grocery Store Truck			
Church / Place of Worship			
Social Services			

*Check with the program to see if you qualify to get food.





Step 3

- **Add new programs**, such as:
 - Comprehensive care management—include health, mental health, substance abuse, domestic violence, food insecurity, housing, transportation, child and elder care, education/job training
 - Provide child care, parenting classes (e.g., schools, jails)
 - Train behavioral health staff on newer techniques that help address trauma, e.g., EMDR
 - Provide healthy foods
 - In the clinic or through vouchers



Nadine Burke Harris

“When we understand that the source of so many of our society’s problems is exposure to childhood adversity, the solutions are as simple as reducing the dose of adversity for kids and enhancing the ability of caregivers to be buffers.”

The Deepest Well: Healing the Long-term Effects of Childhood Adversity
2018

“Resilience” *trailer*



Step 4/All Steps

- Children:
 - Prevent ACEs
 - Home Visiting
 - Support pregnant women/young families
 - **Whatever it takes:** Parenting training, food programs, help with finances, child care, transportation, vocational training
 - Screen for ACEs (or the equivalent*) in children
 - And **intervene** as early as possible
 - Excellent child care/Head Start



Step 4/All Steps

- Children
 - An alternative to ACE screening
 - Dr. Matt Hirschfeld—4 Questions during the Well Child visit:
 1. Has anything really stressful happened to your child since the last time I saw you?
 2. How has that affected your child's behavior?
 - a) Corollary question: How has this event and any changes in your child's behavior affected you?
 3. What have you done that's really fun with your child since the last time I saw you?
 4. Give me 3 words that describe your child to you.



Whether to Screen for ACEs in Adults in Primary Care?

- ACEs are high in AI/AN populations
 - So is screening useful?
- Providers need to understand that an ACE score is **not**:
 - A diagnosis
 - Destiny
 - *Protective* factors weren't counted
 - Remember that ACE studies were done in *populations*
- Vincent Fellitti: “I see that you have experienced _____. Can you tell me how this has affected you later in life?”



How to address ACEs?

Decrease risk factors, increase protective factors

- Screening?
 - Children? Pregnant women? Everyone?
 - If so, be sure there is a clear plan for what to do with + responses
 - And clinicians understand what an ACE score does/doesn't mean
- Prevention interventions?
 - Support pregnant women and young families
 - Home visiting, parenting classes, excellent child care/Head Start
 - *At least one caring adult in every child's life*
- Address the larger context and definition of “ACEs”?
 - Food security
 - Work with school system, law enforcement, social services to change to a “trauma-informed’ approach
 - Education, vocational training, financial skills
 - People who know who they are: Culture

Pima Pride Study

- Pilot study for the DPP clinical trial conducted by NIH
- Pima Indians who were obese but normoglycemic were randomized to:
 - “Pima Action”: lifestyle intervention group
 - Structured diet/exercise meetings
 - “Pima Pride” control group
 - Unstructured activities emphasizing Pima culture and history
- **At the end of the study, the “Pima Pride” group had more positive results on every biological parameter measured**

Diabet Med 1998;15:66-72



**Stress, Trauma, and Food Insecurity are the roots of many problems.
But they are also preventable.**

What can we do to help our communities move forward?



“The medicine is already within the pain and suffering. You just have to look deeply and quietly. Then you realize it has been there the whole time.”

Duran, 2006

Thank you

ann.bullock@ihs.gov



Historical Trauma

- Traumas that are often intentionally inflicted and occur at about the same time to a defined group of people—these traumas:
 - Have effects like individual traumas, *plus*
 - Because the traumas are so pervasive, devastate parents as well as children, disrupt community and cultural infrastructures—they have profound effects on the ability to:
 - Cope with and adapt to traumatic events and aftermath
 - Interpret the meaning and psychologically incorporate the trauma
- Not unique to any particular group
 - Research in Holocaust survivors and descendants
- **Intergenerational Trauma:** Traumatized parents are then the “Vector of transmission” to subsequent generations
- Traumas are ongoing: chronic poverty, food insecurity, and racism/discrimination