



# **THE LIFE JOURNEY**

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## **Impacts of Trauma**



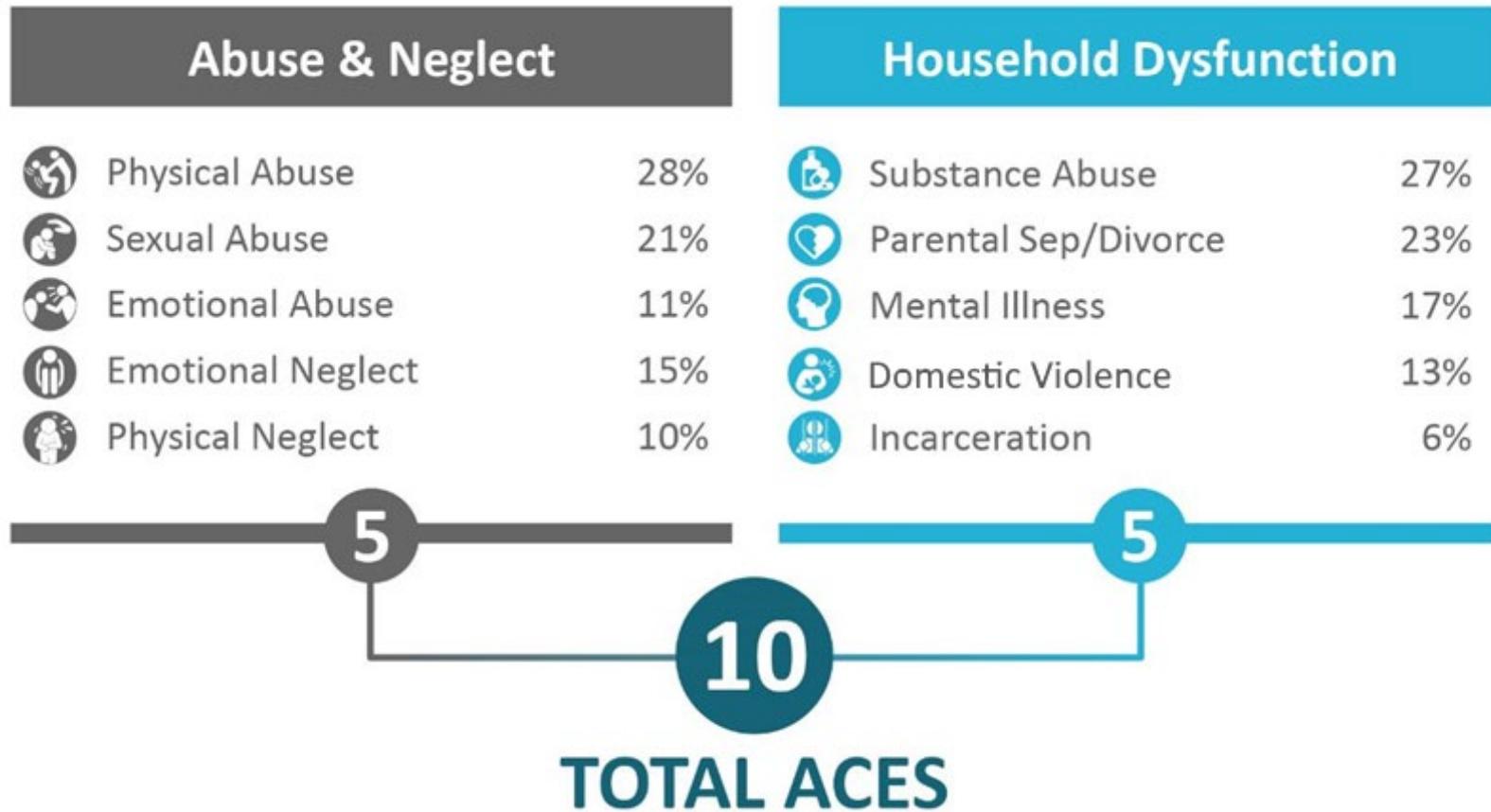
# Adverse Childhood Experiences (ACEs)



**Study based on  
17,000 patients in  
San Diego, CA**

Photo by Ted Eytan, CC

# ACEs Are Common



# ACE Score = Number of ACE Categories

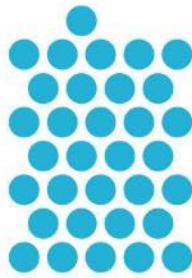
33%

26%

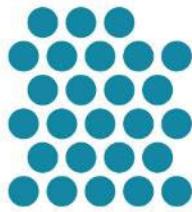
16%

10%

16%



0  
ACEs



1  
ACE



2  
ACEs

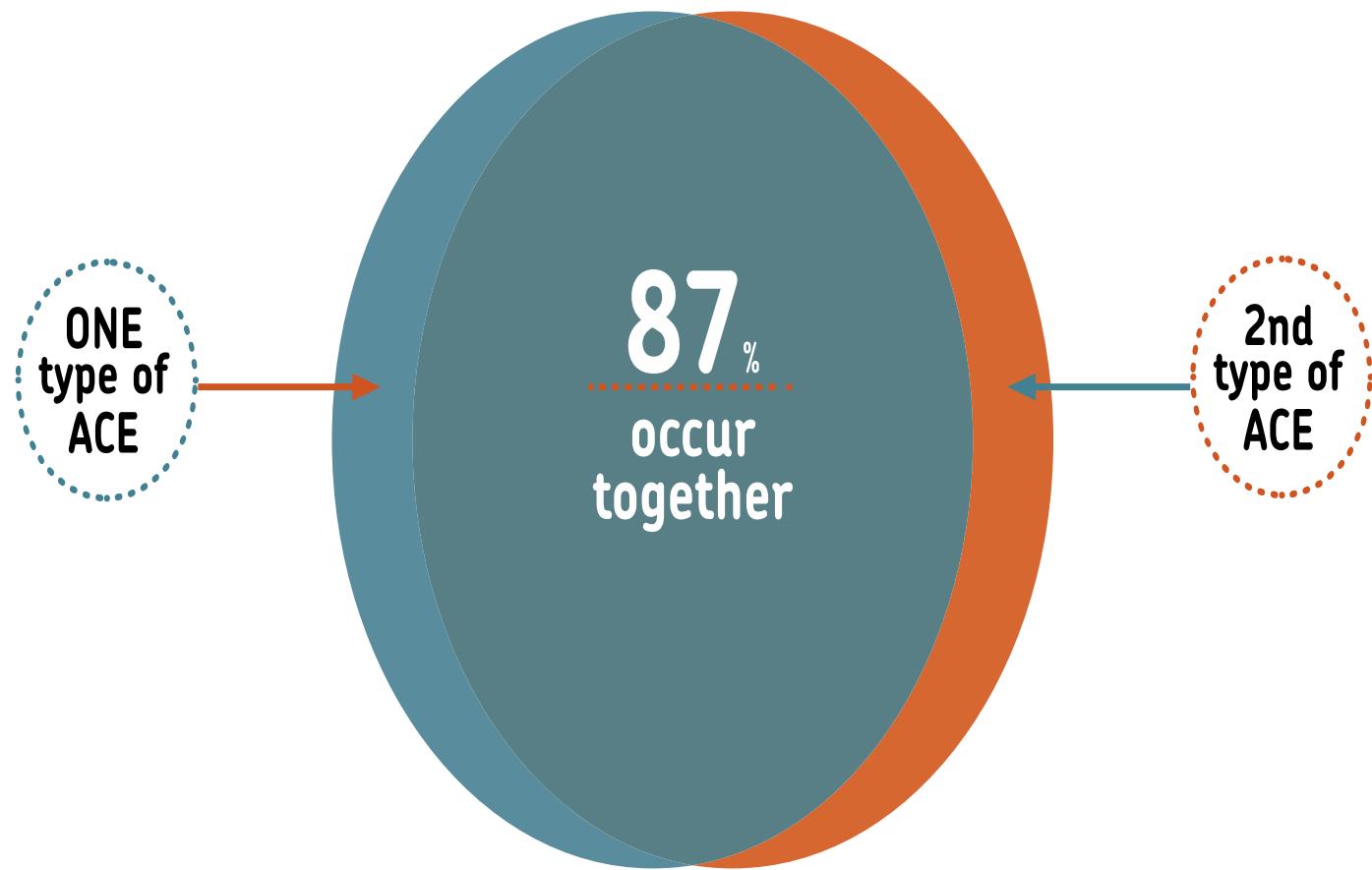


3  
ACEs

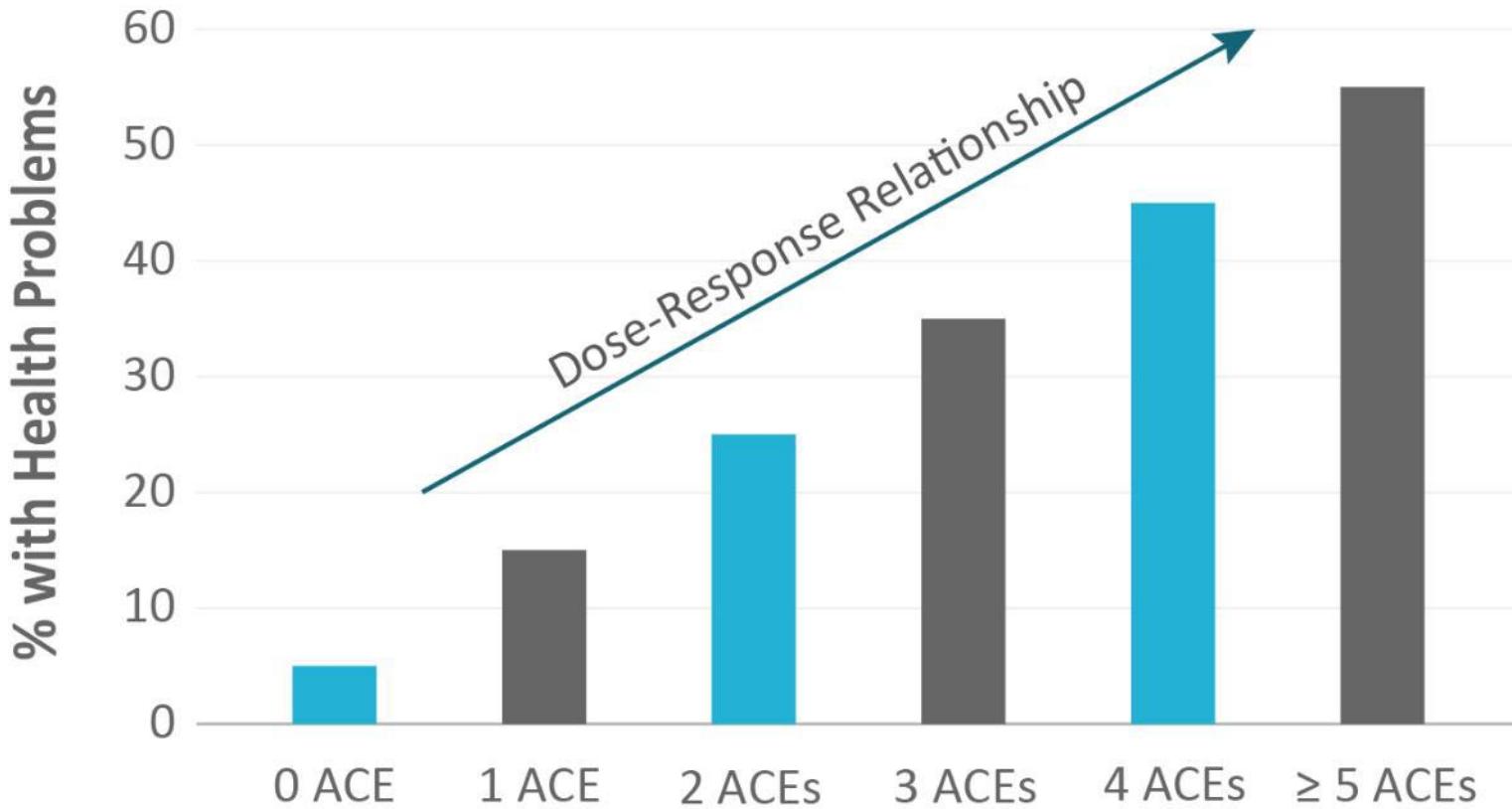


4+  
ACEs

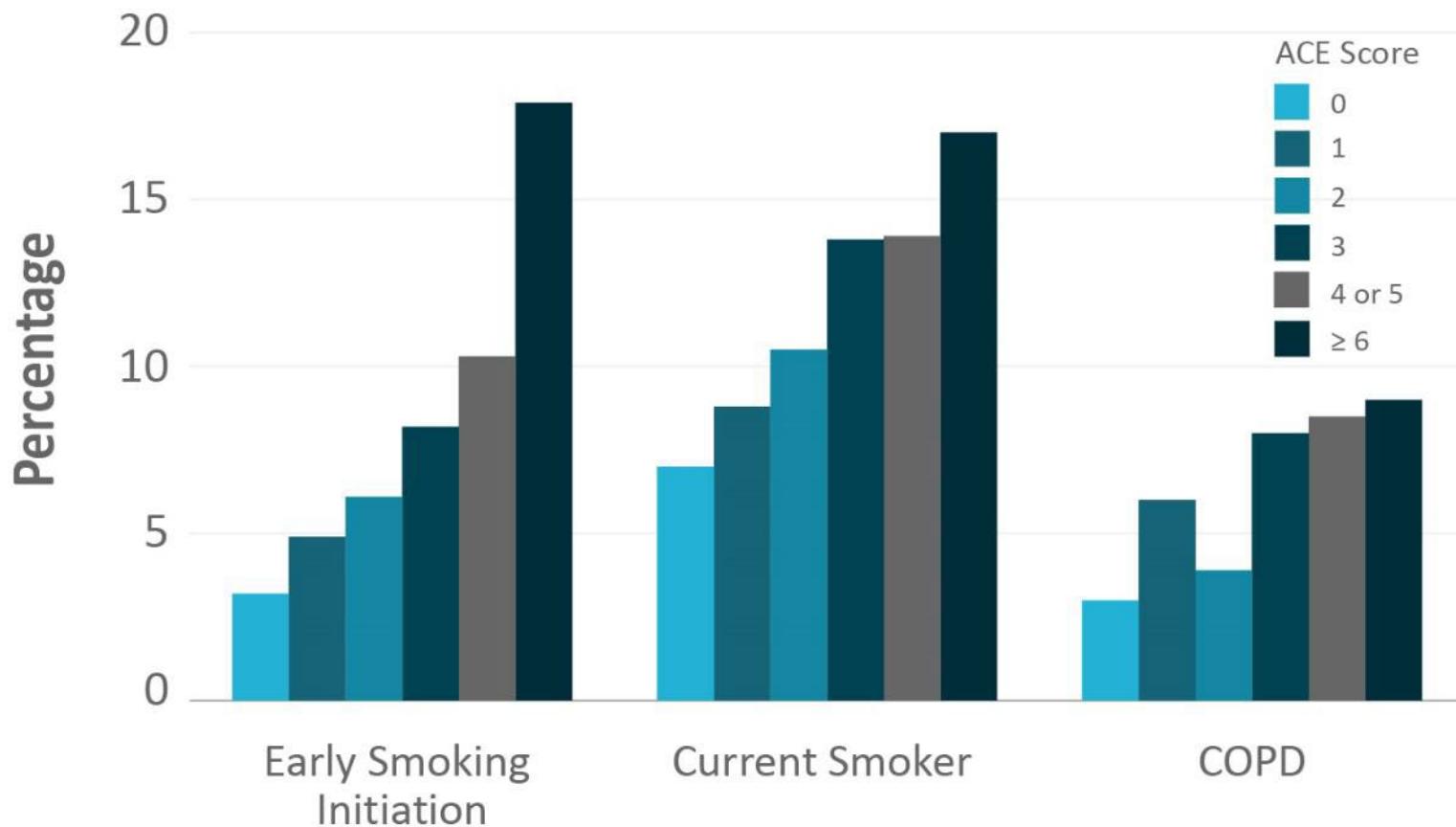
# Where One ACE Occurs, There are Usually Others



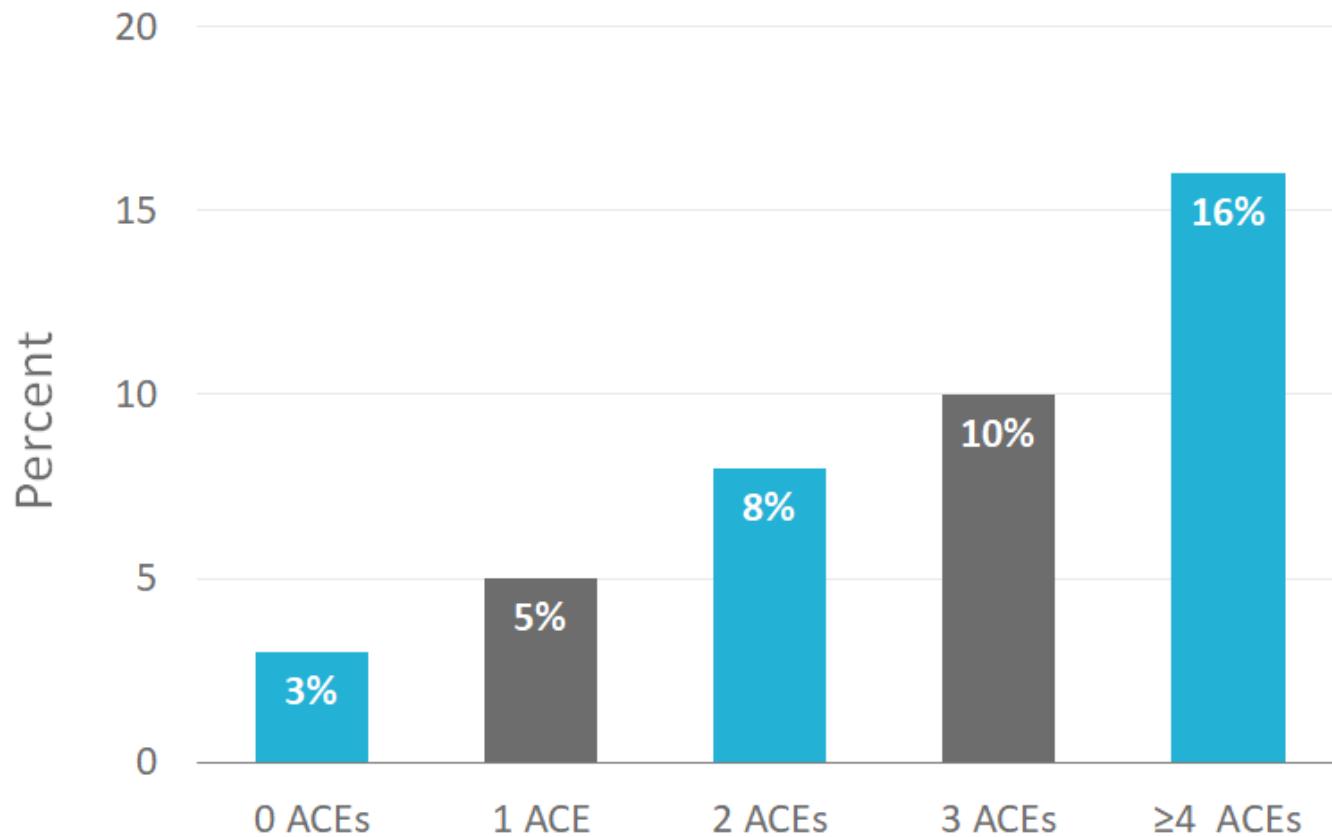
# ACEs & Health Problems



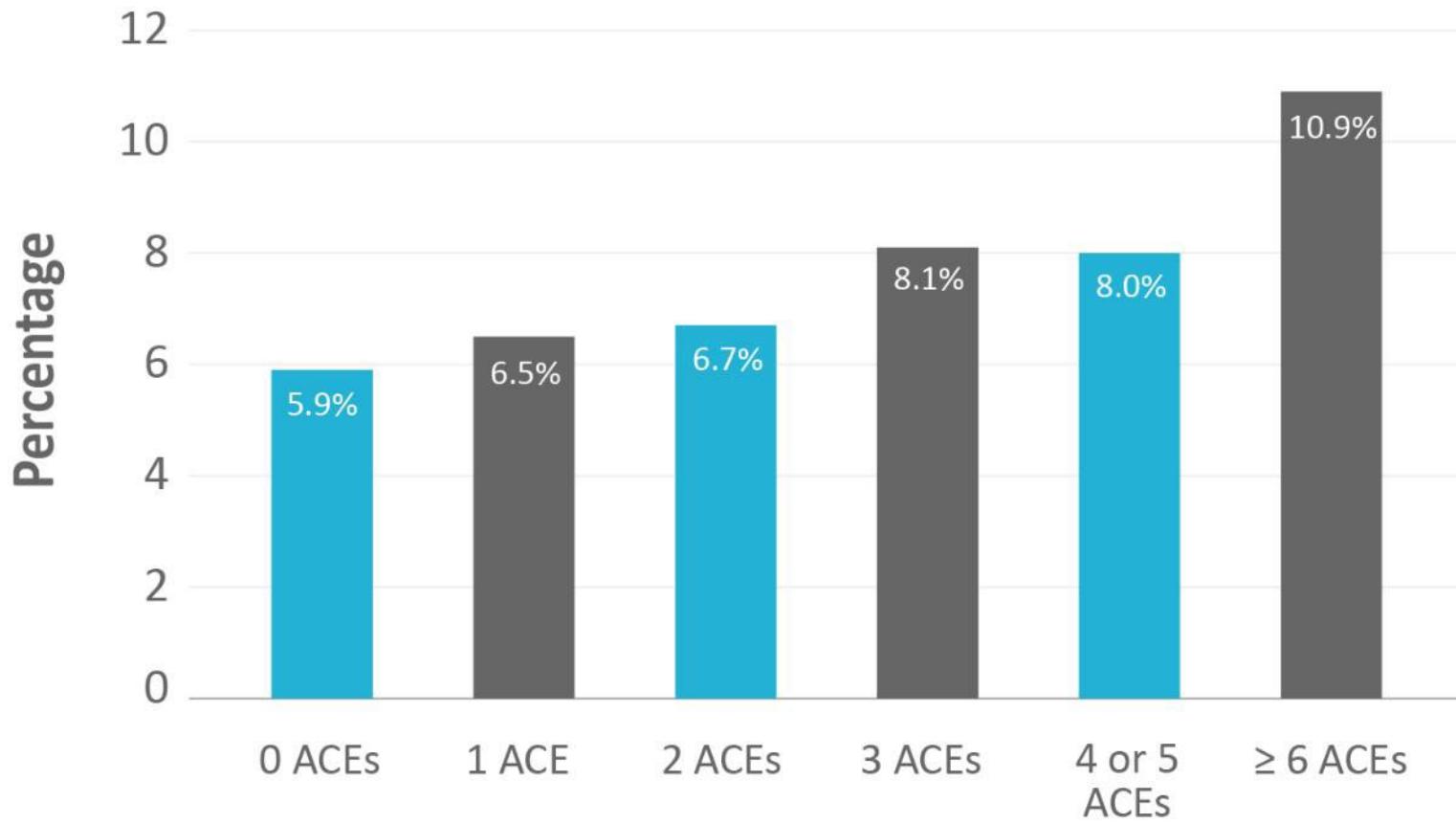
# ACES & Smoking



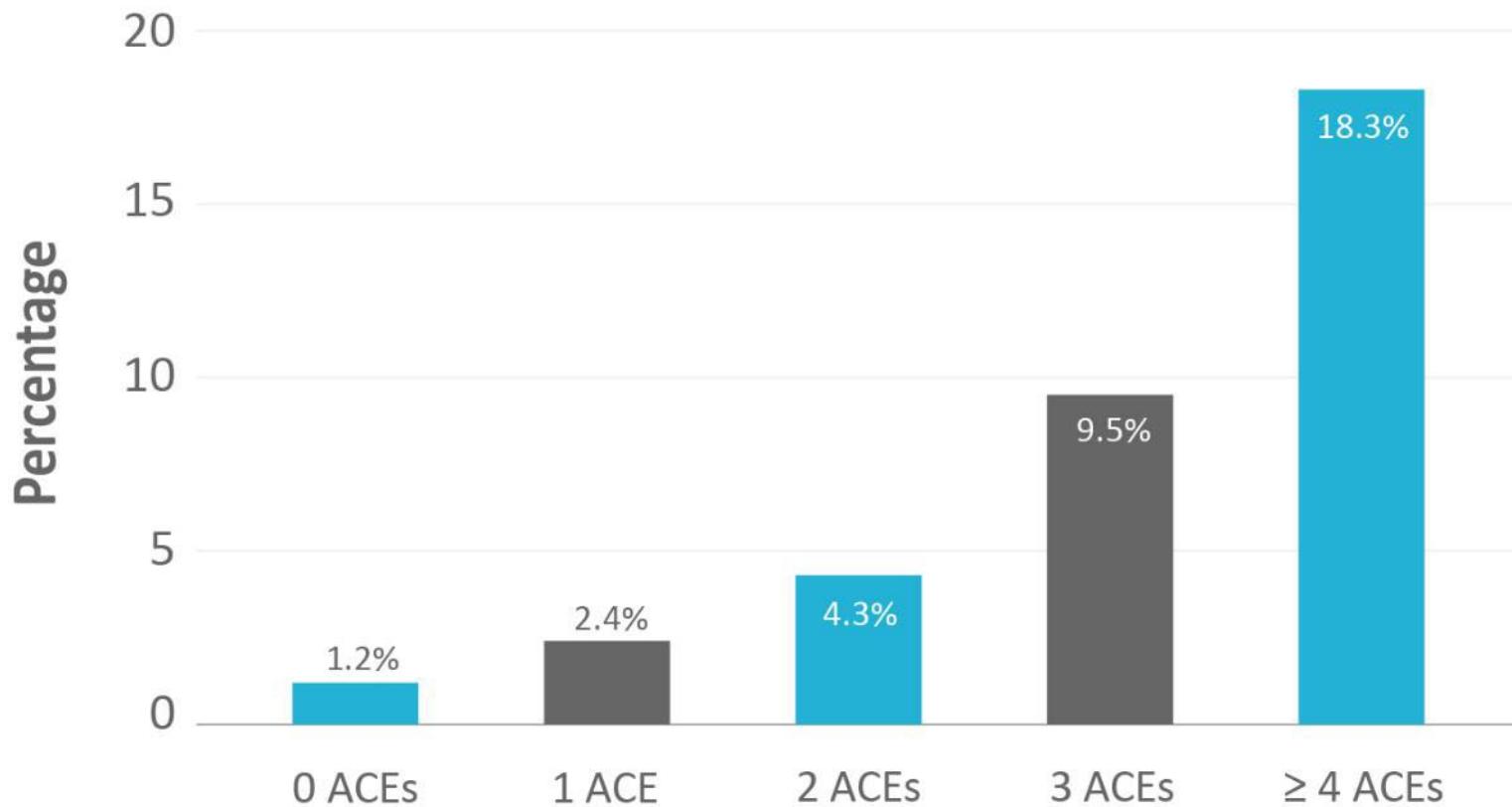
# ACEs & Alcoholism



# ACEs & Liver Disease

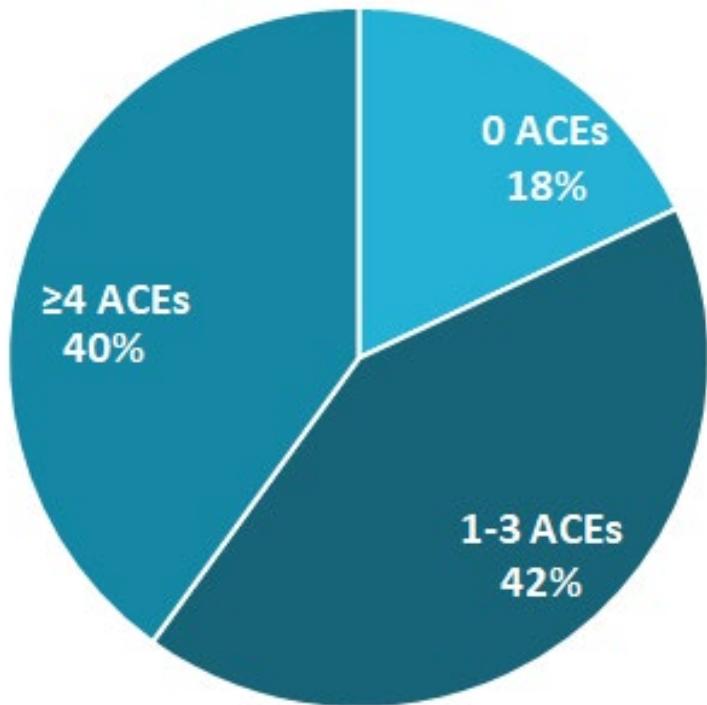


# ACEs & Suicide Attempts

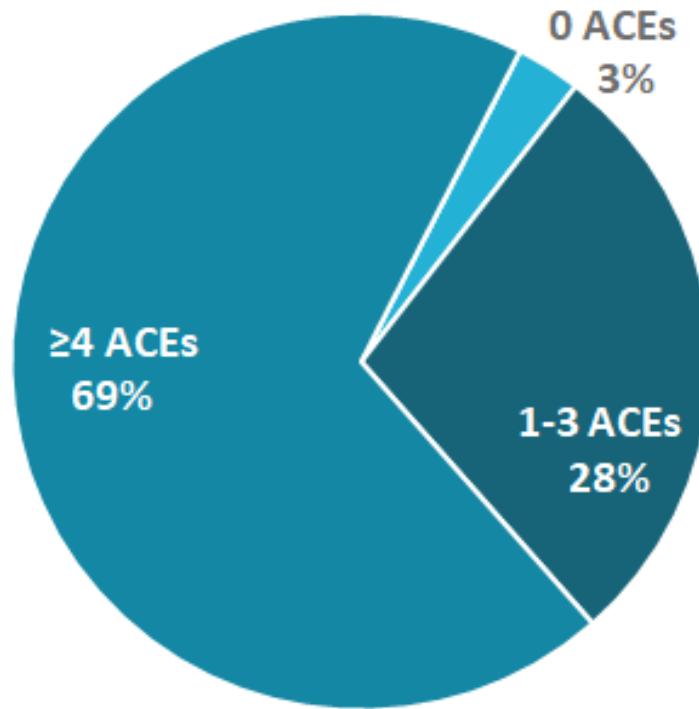


# Perpetrating DV/SV is associated with high ACE scores

Domestic Violence



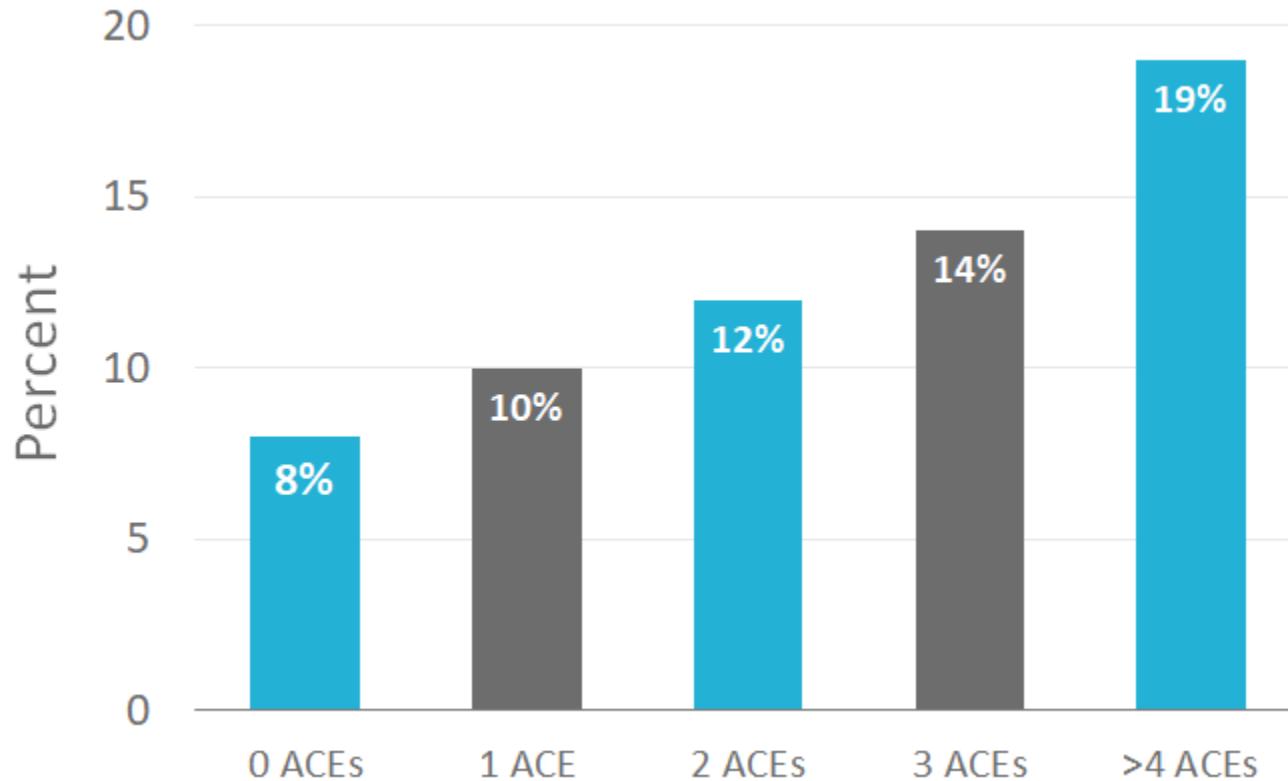
Sexual Offenders



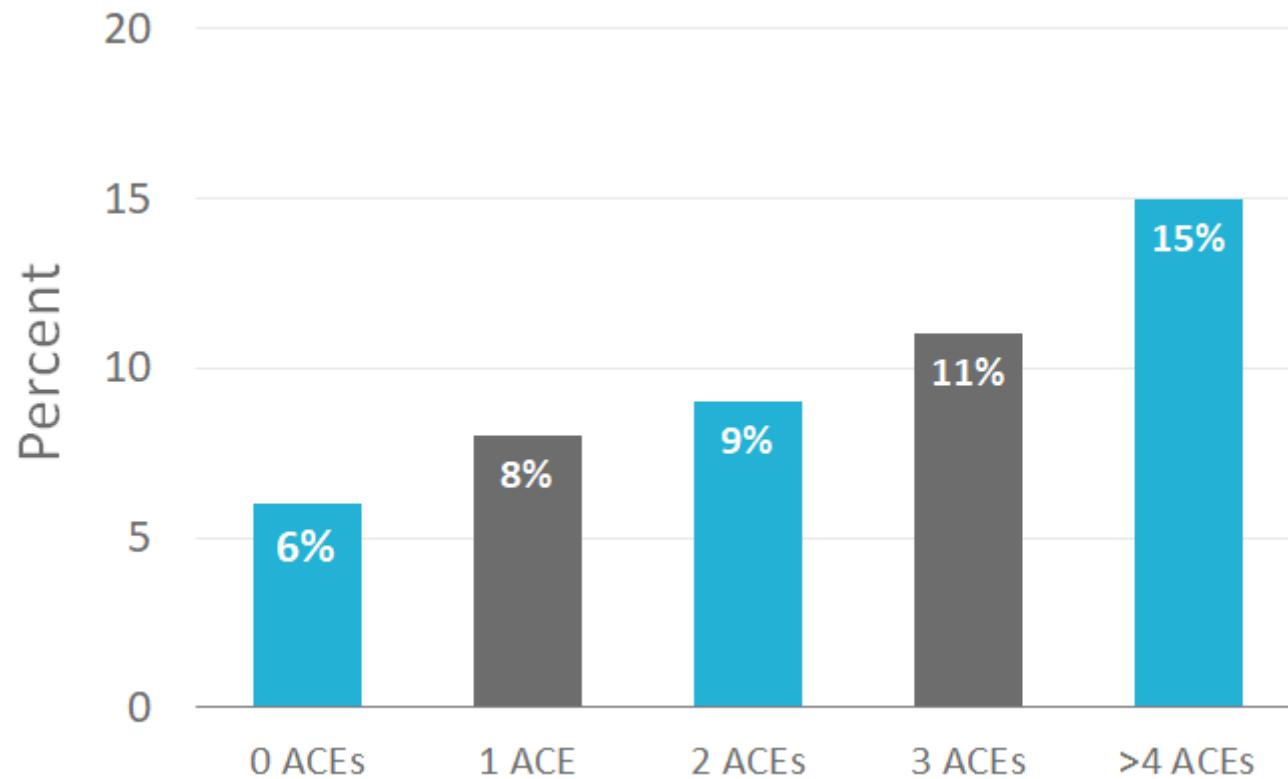
Boys w/  
an ACE  
score of  
6+ are

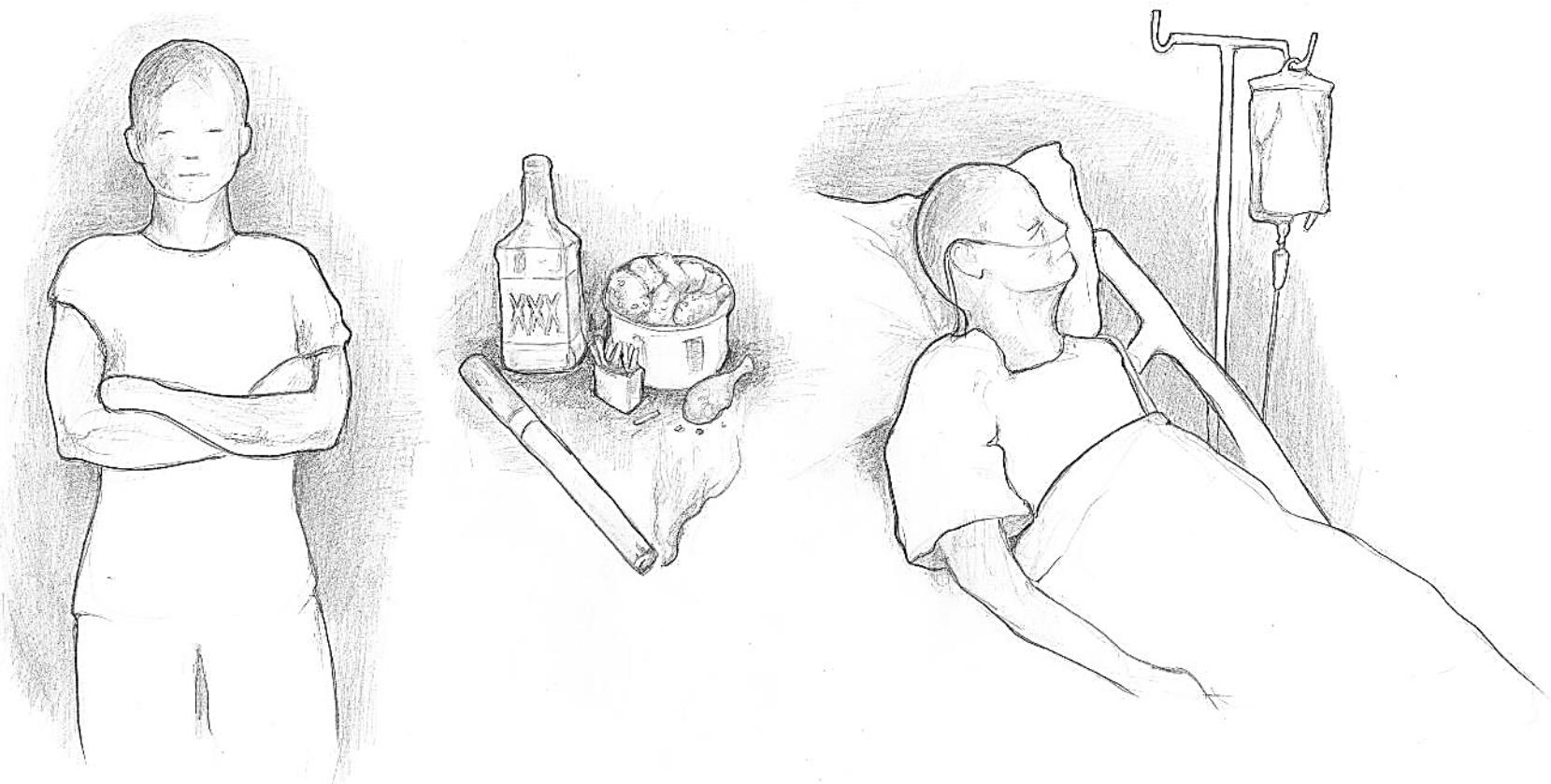
46x  
as likely  
to use IV  
drugs

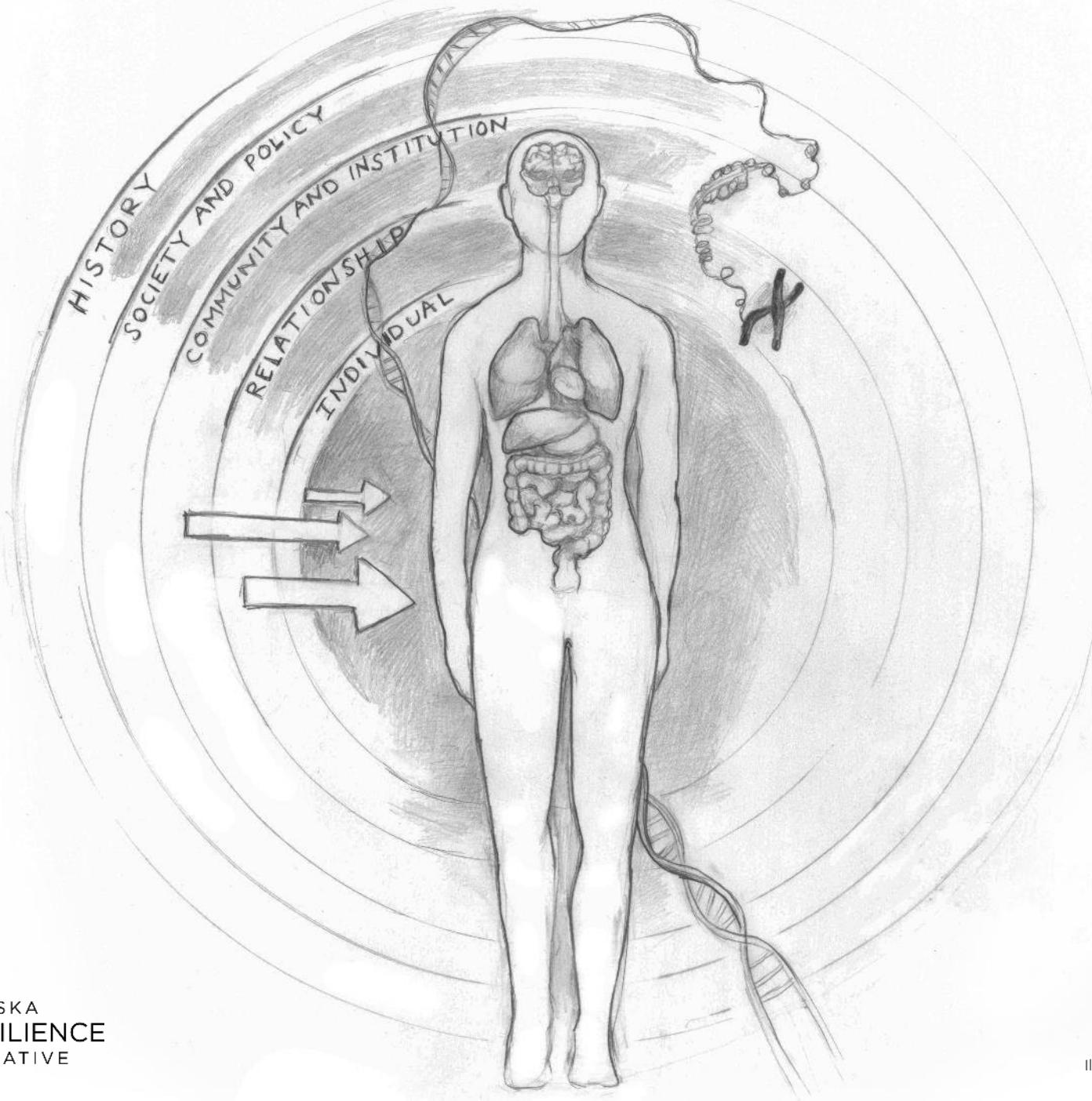
# ACEs contribute to serious job problems



# ACEs Contribute to Absenteeism







# Jared Parrish, PhD



## HOUSEHOLD CHALLENGES

## ABUSE



Physical



Emotional



Sexual

18.6%

39.1%

15.8%



Parent Treated Violently

18.7%



Substance Misuse

34.1%



Mental Illness

21.5%



Incarcerated Relative

11.4%



Divorce

31.7%

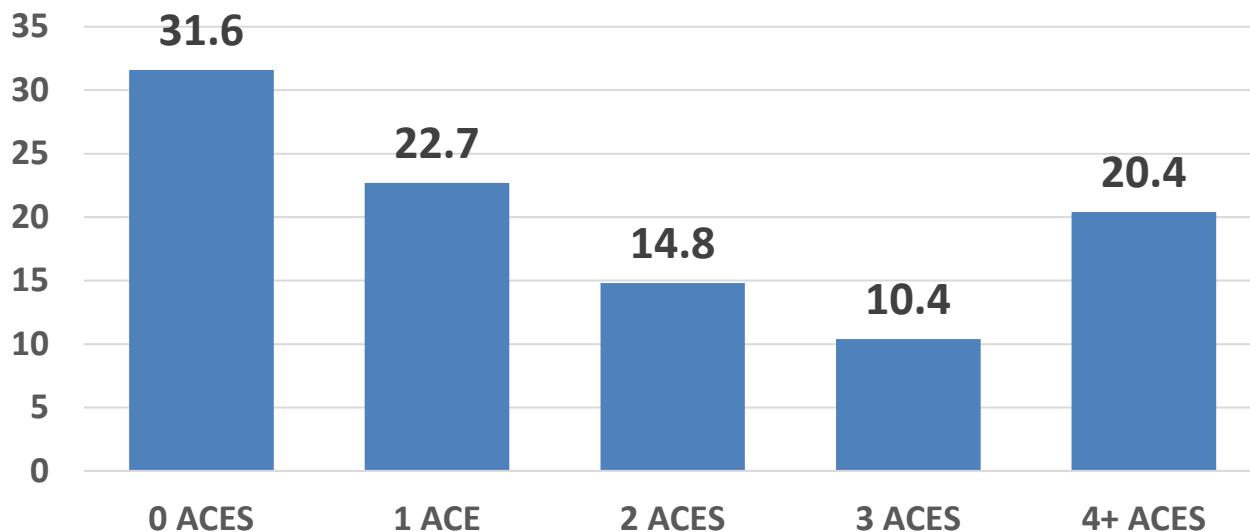
## Individual ACES are common among Alaska Adults.

The top **3** individual ACES reported include:

- 1) Experiencing emotional abuse
- 2) Substance misuse by an adult in the home
- 3) Divorce of a parent

**Source:** Alaska data from the 2013-2015, Alaska Behavioral Risk Factor Surveillance System, Alaska Department of Health, Division of Public Health, Section of Chronic Disease Prevention and Health Promotion

# Percent of Alaska Adults reporting accumulated ACES



**68.4%** of Alaska Adults reported experiencing at least 1 ACE

For more info on ACEs in Alaska visit:  
<https://health.alaska.gov/abada/ace-ak/documents/acesreportalaska.pdf>

**Source:** Alaska data from the 2013-2015, Alaska Behavioral Risk Factor Surveillance System, Alaska Department of Health, Division of Public Health, Section of Chronic Disease Prevention and Health Promotion

# ALCANLink

Alaska Longitudinal Child Abuse and Neglect Linkage Project

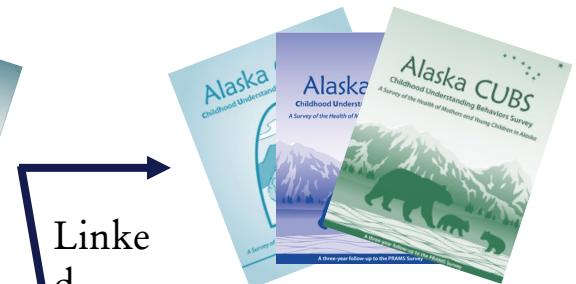
## A population-based mixed design



1 per 6 sample d



2009 – 2018  
(3 cohorts)



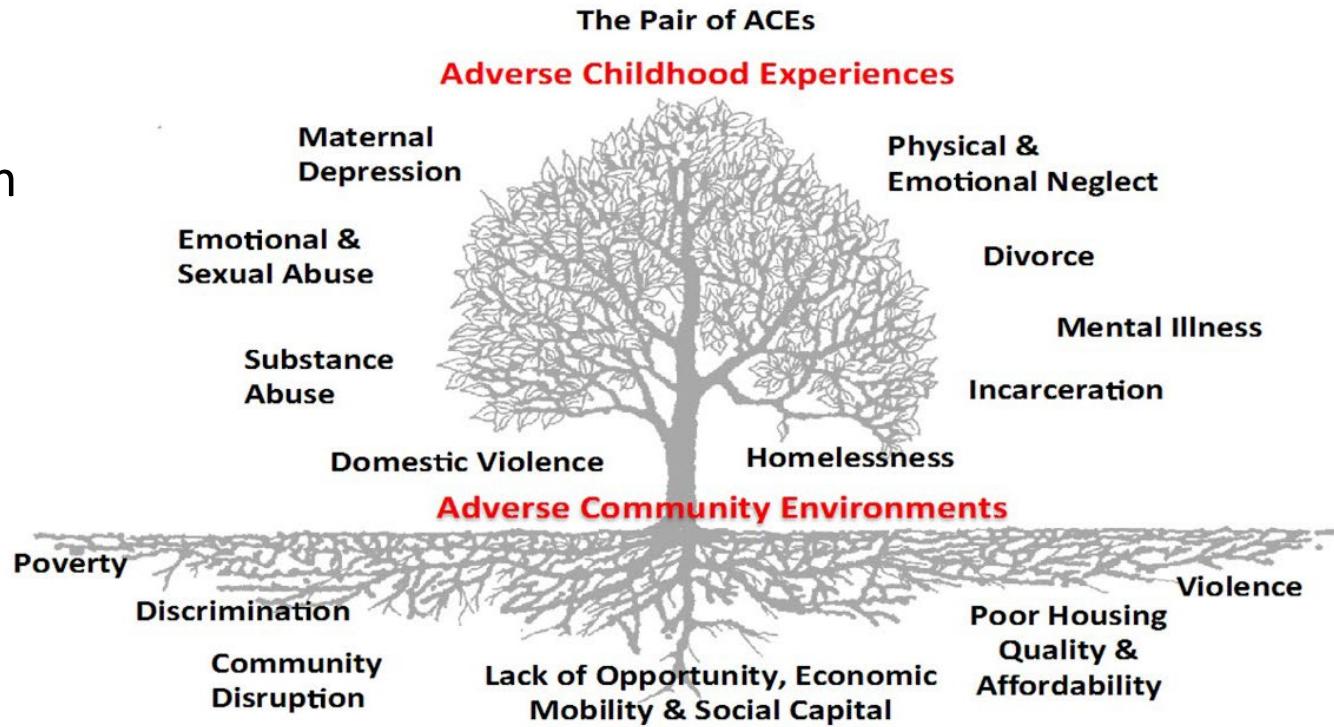
3 – Year  
Follow – Up

Annual

Linkages

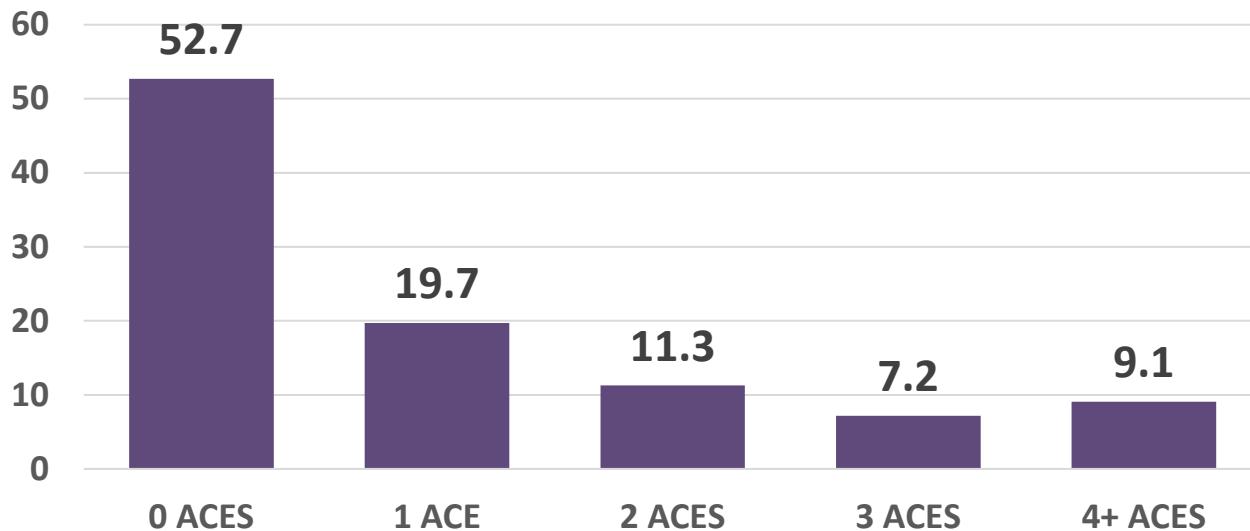
- ❖ Permanent Fund Dividend
- ❖ Office of Children's Services
- ❖ Birth/Death Records
- ❖ Medicaid
- ❖ Dept. of Education & Early Development

Original ACES have been expanded to measure other adversities that can lead to trauma



Ellis, W., Dietz, W. (2017) A New Framework for Addressing Adverse Childhood and Community Experiences: The Building Community Resilience (BCR) Model. *Academic Pediatrics*. 17 (2017) pp. S86-S93. DOI information: 10.1016/j.acap.2016.12.011

# Percent of Alaska 3-year-olds experiencing accumulated ACES



**47.3%** of Alaska 3-year-old children have experienced at least 1 ACE.

## Top 4 individual ACES:

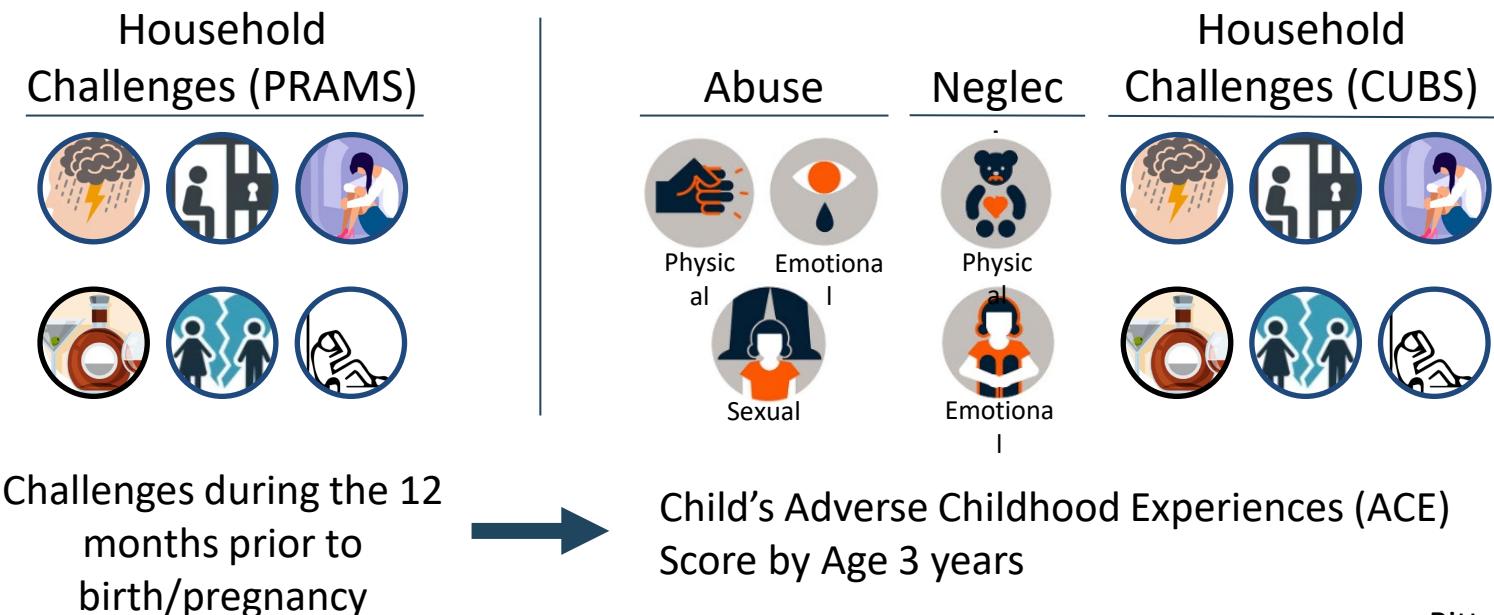
- 1) Financial issues paying bills (23.1%)
- 2) Parent job loss (19%)
- 3) Substance abuse in close family member (15.5%)
- 4) Neglect (15.3%)

**Source:** ALCANLink, 2009 – 2018 births, Alaska Department of Health, Division of Public Health, Section of Women’s Children’s and Family Health

# **PRE-BIRTH CHALLENGES IMPACT ON EARLY CHILDHOOD EXPERIENCES**

# Pre-Birth Household Challenges

## Predicting Child ACE Score



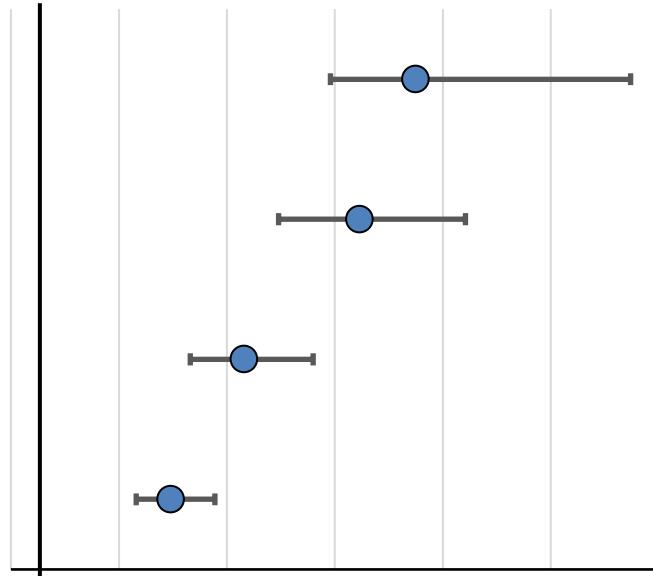
Rittman et al.  
(2020)

4+ Challenges

3 Challenges

2 Challenges

1 Challenge



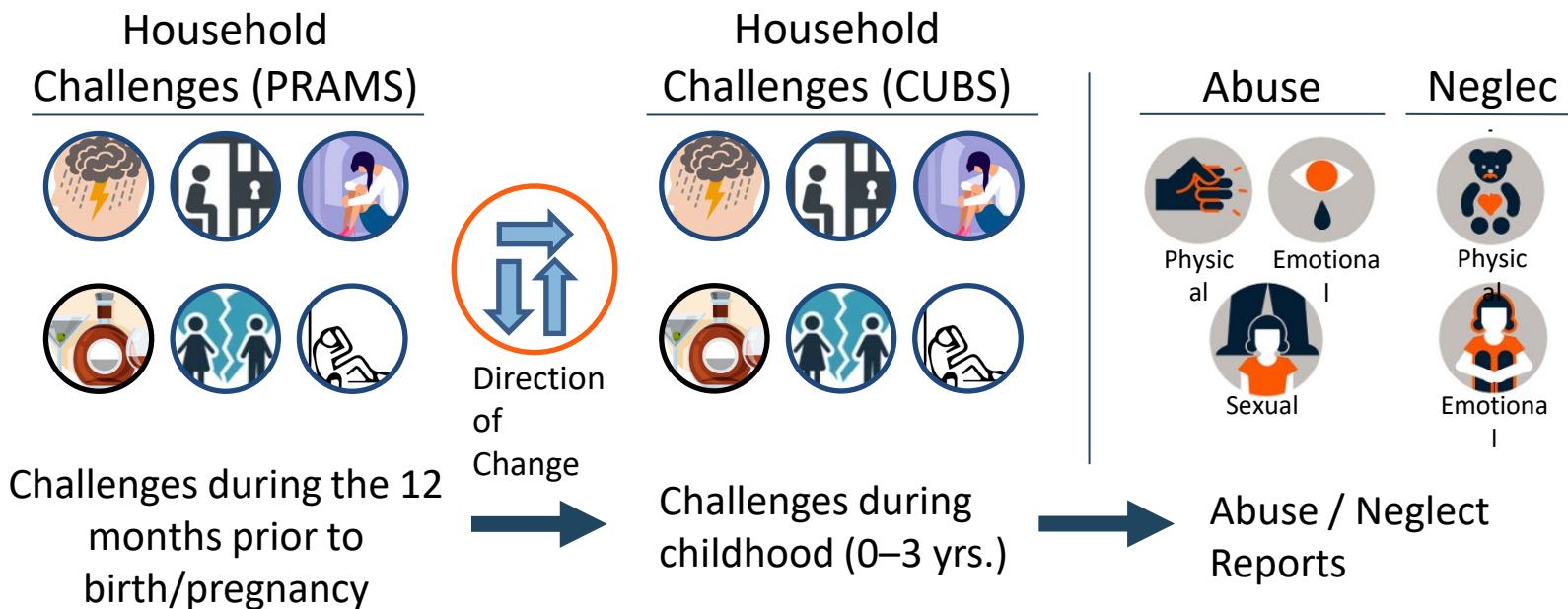
**Pre-Birth Household Challenges Predict Child ACE Score at age 3 years!**

**Key Point:**

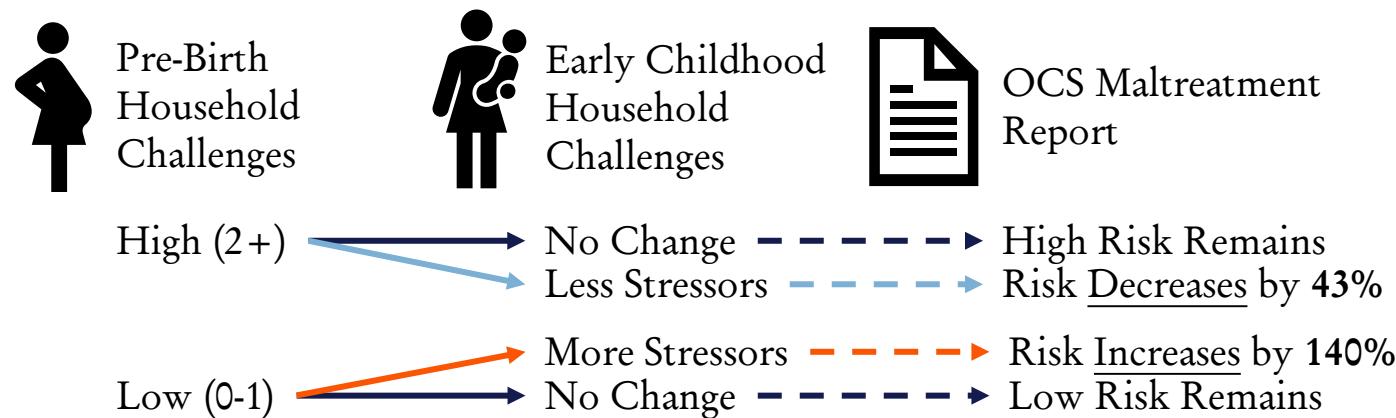
For each additional pre-birth challenge reported, a systematic relative increase in average childhood ACE score was observed.

Rittman et al. (2020)

# Changes in Household Challenges Predicting Maltreatment

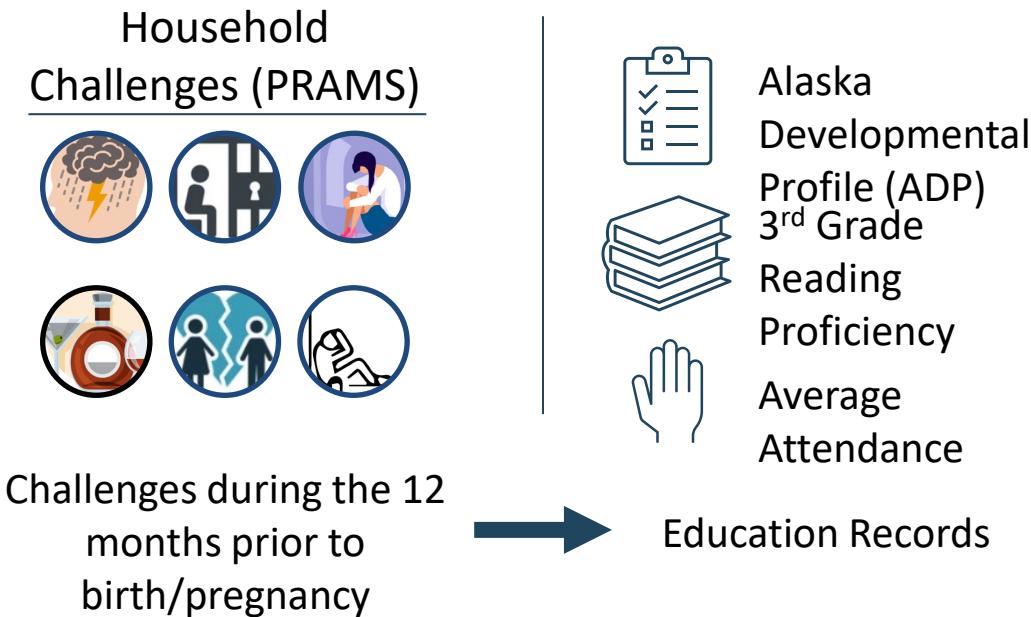


# A Change in the Number of Household Challenges is Associated with Change in Risk of OCS Report



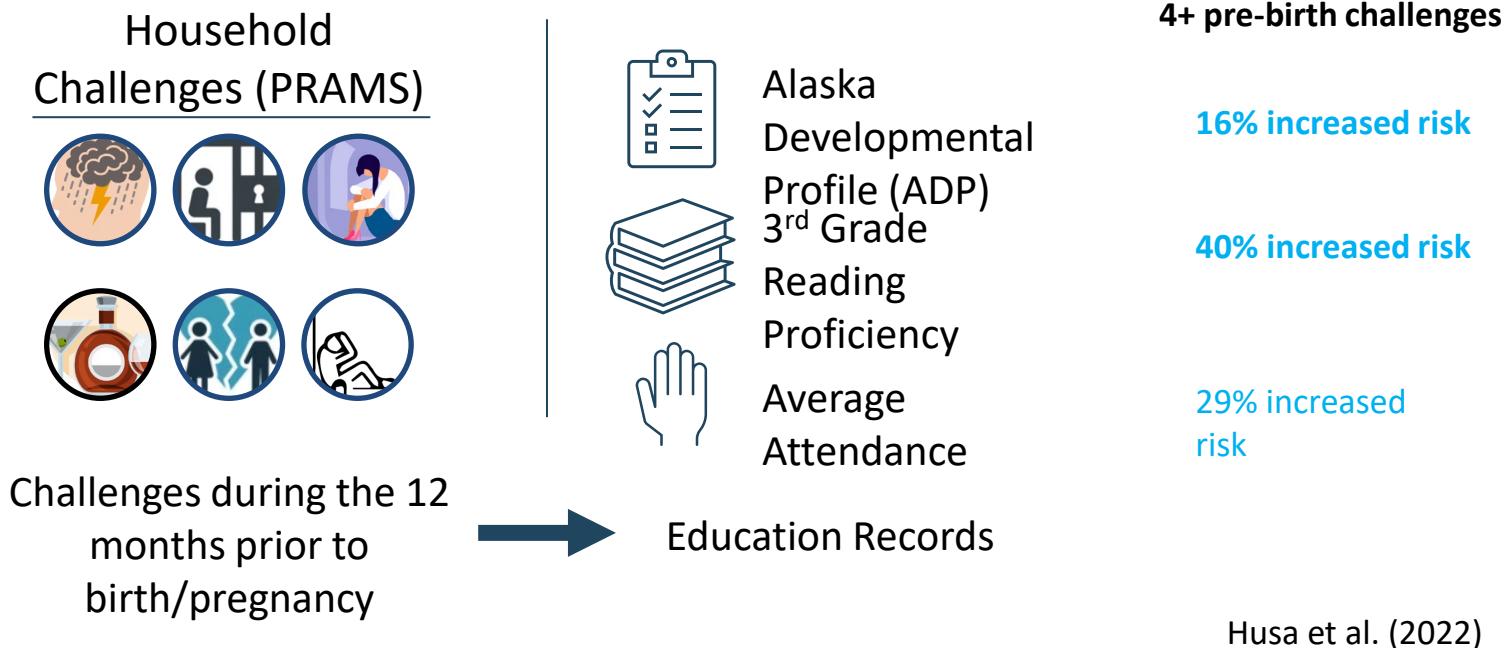
OCS: Office of Children's Services

# Pre-Birth Household Challenges Predict School Readiness & Academic Achievement.

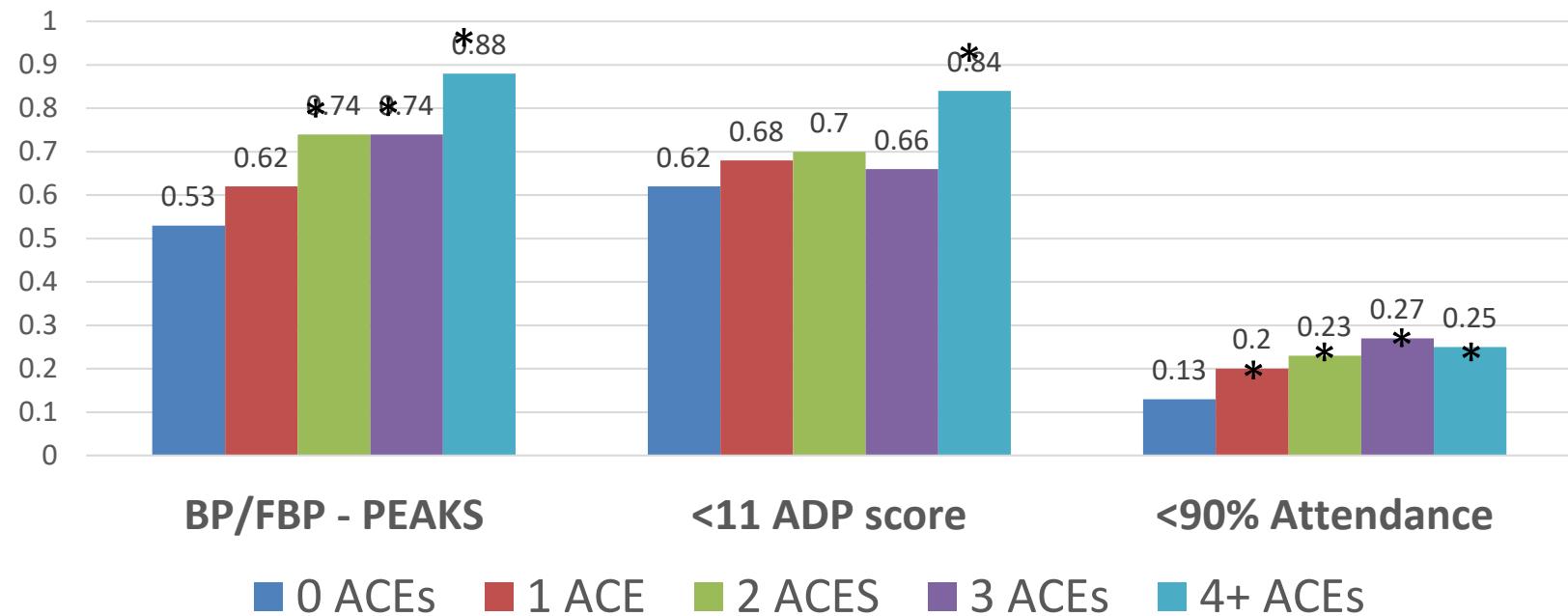


Husa et al. (2022)

# Pre-Birth Household Challenges Predict School Readiness & Academic Achievement.

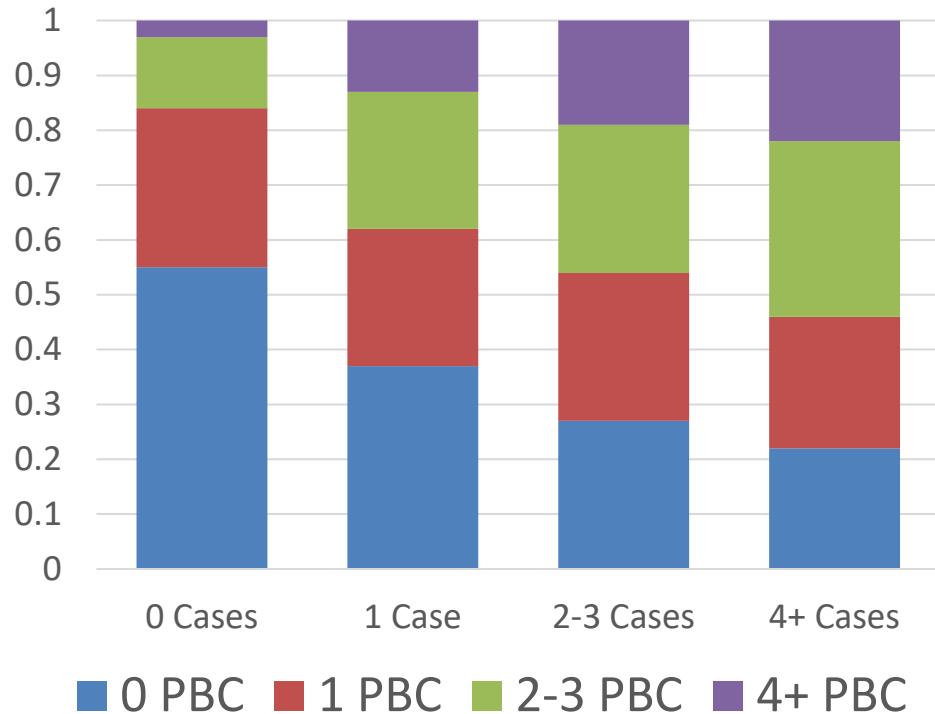


# ACEs at age 3- years and School readiness



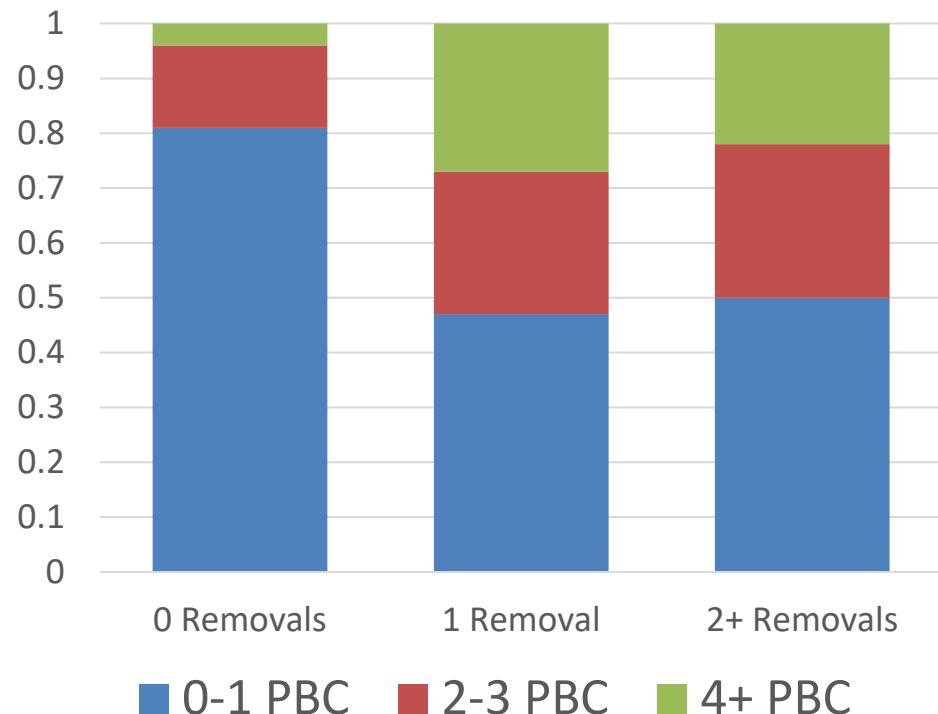
## Number of pre-birth challenges by OCS cases

As number of screened-in cases increases the proportion with multiple prebirth challenges increases

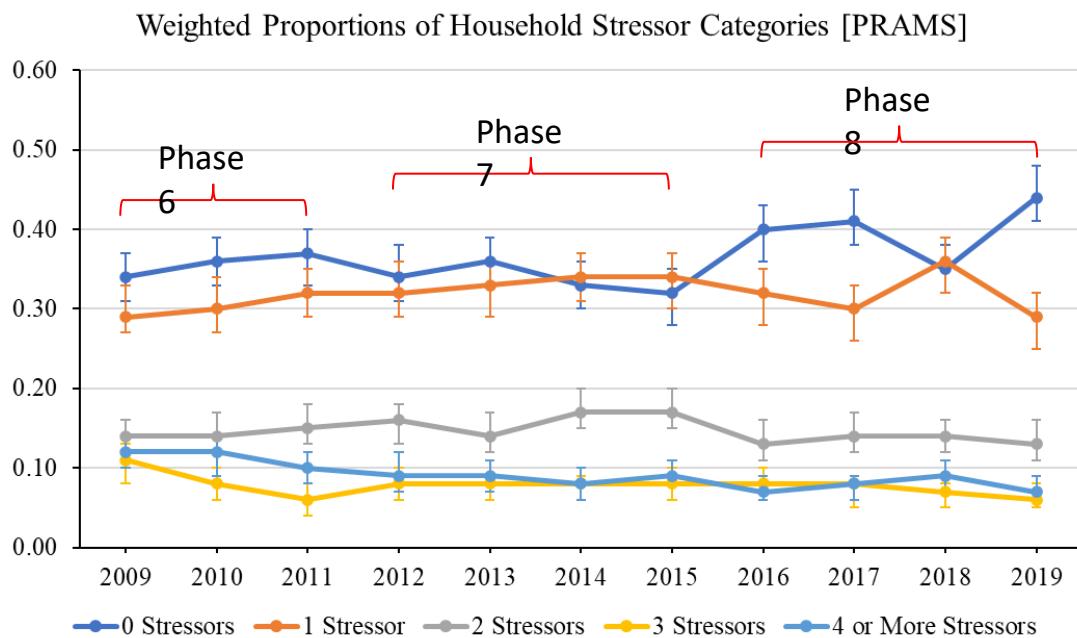


## Number of pre-birth challenges by OCS removals

Over 50% of those experiencing at least 1 removal were born to mothers reporting 2 or more pre-birth household challenges.



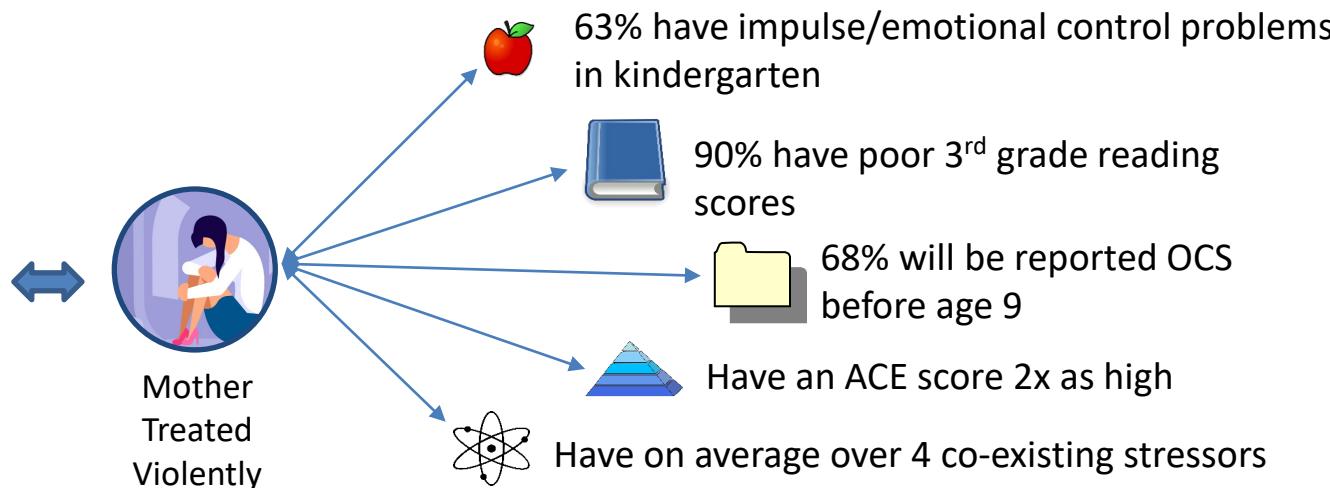
# Pre-Birth Household Challenges hasn't changed much over time



**Note:** Trending across PRAMS phases should be interpreted with caution due to changes in some questions asked.

# Connecting Early Indicators with Child Outcomes

-  Mental Illness
-  Incarcerated Relative
-  Substance Abuse
-  Financial Issues



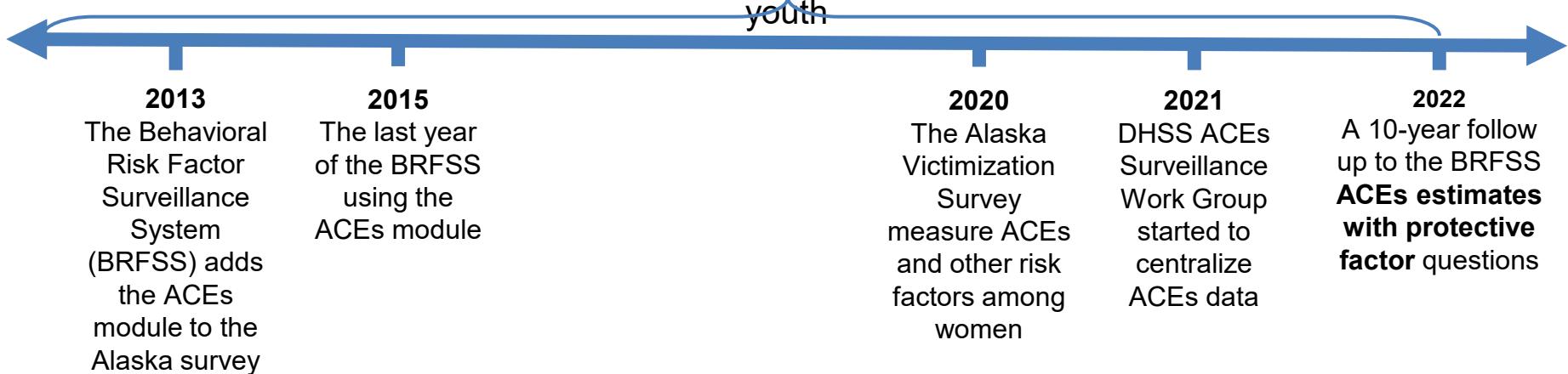
# Coming soon!

## Overcoming ACES with Resiliency (OARS) survey

- **Goal:** Collect ACEs data in the context of protective experiences at each socio-ecological level.
- Method: Web-based survey, ~80 questions
  1. Protective factor section
  2. Adult health outcomes section
  3. ACEs section
  4. Demographics section

We've moved beyond simply quantifying experiences to doing something about them!

PRAMS, CUBS, and YRBS  
measure ACEs and other risk  
factors among women, children, and  
youth



# **Contact Information**

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ALCANLink website:

<http://dhss.alaska.gov/dph/wcfh/Pages/mchepi/ALCANlink/>

# Economic costs of ACEs in Alaska



HEALTH BEHAVIOR OR OUTCOME	EST. ANNUAL COSTS LINKED W/ACEs
Adult Medicaid (Age 20+)	\$382 million
Current Smoker	\$203 million
Non-Gestational Diabetes	\$117 million
Binge Drinking	\$69 million
Arthritis	\$60 million
Obesity	\$34 million
<b>TOTAL</b>	<b>\$866 million</b>



ALASKA  
RESILIENCE  
INITIATIVE

Source: Sidmore, 2016. Economic Costs of ACEs in Alaska

# Linda Chamberlain, PhD



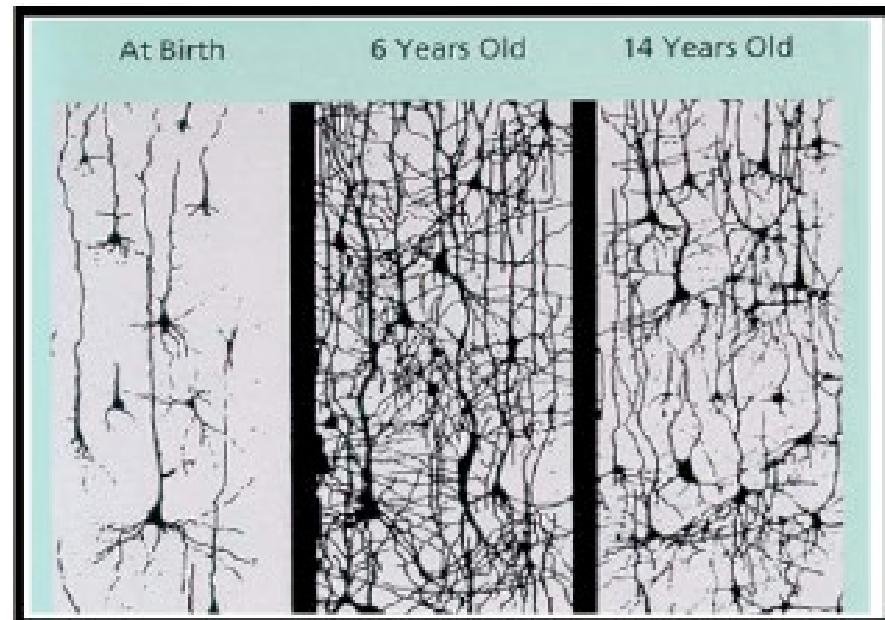
# Risk and Resiliency

**Neuroplasticity=the ability of the human brain to adapt and change in response to experience and environment**



# SYNAPTIC PRUNING: The Right Experience at the Right Time

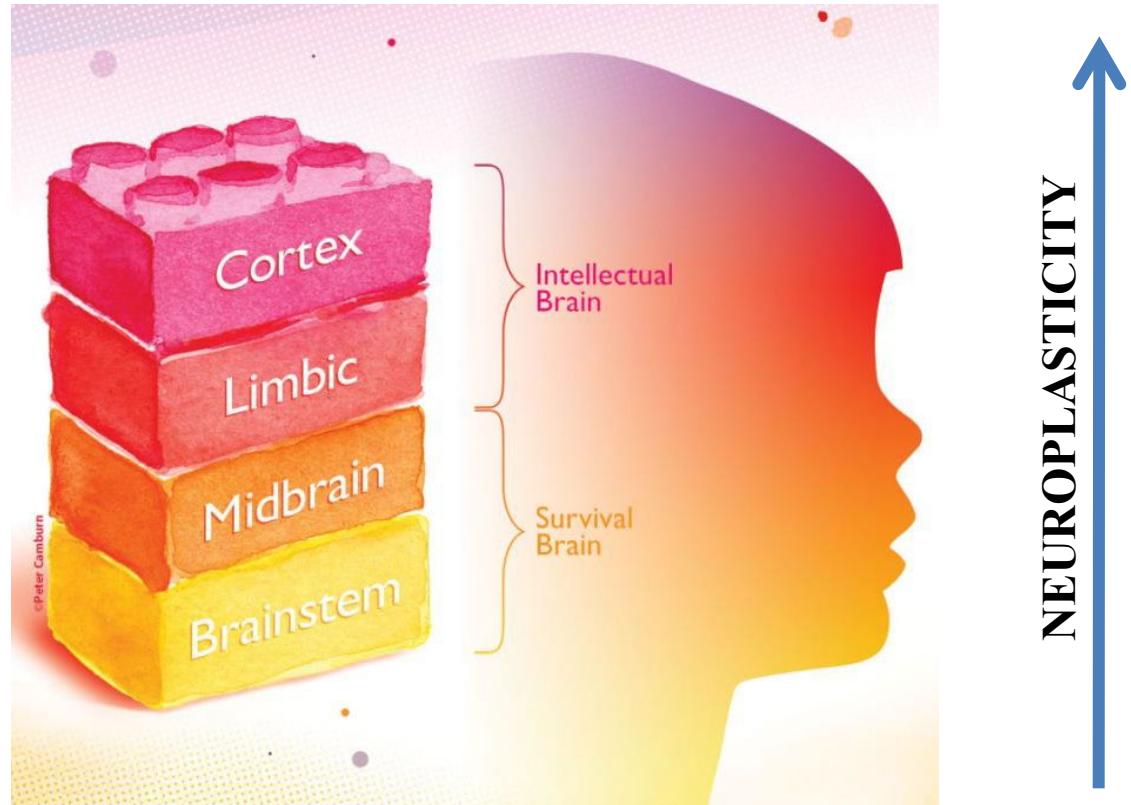
- SYNAPSES=WIRING OF BRAIN
- Experience builds the brain
  - birth: 50 trillion synapses
  - 1 year: 1,000 trillion
  - 20 years: 500 trillion



NATURE AND NURTURE!!

# Sequential Development of a Child's Brain

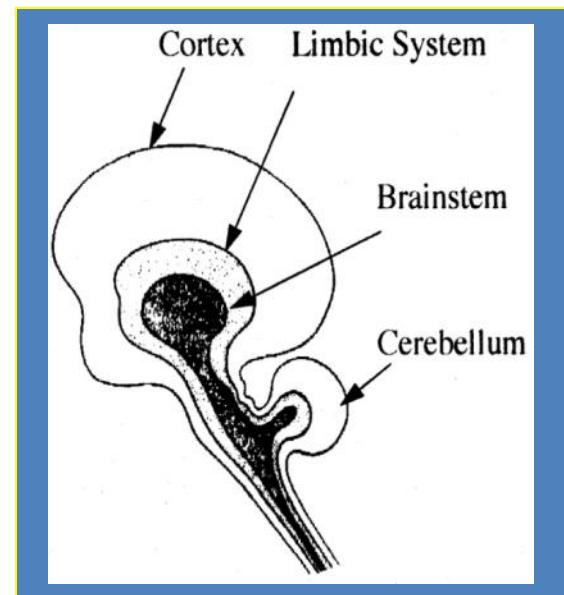
**Abstract Thought**  
**Problem solving**  
**Affiliation**  
**Attachment**  
**Emotional Reactivity**  
**Motor Regulation**  
**Sleep**  
**Digestion**  
**Blood Pressure**  
**Heart Rate**  
**Respiration**  
**Body Temperature**



Peter Camburn

# There are Sensitive Periods of Development

- Emotions are set by the limbic system and prefrontal lobes
- Limbic system forms an emotional blueprint for later use
- Both lobes are developed and connected early in life (8-18 months)



## Positive Stress

## Tolerable Stress

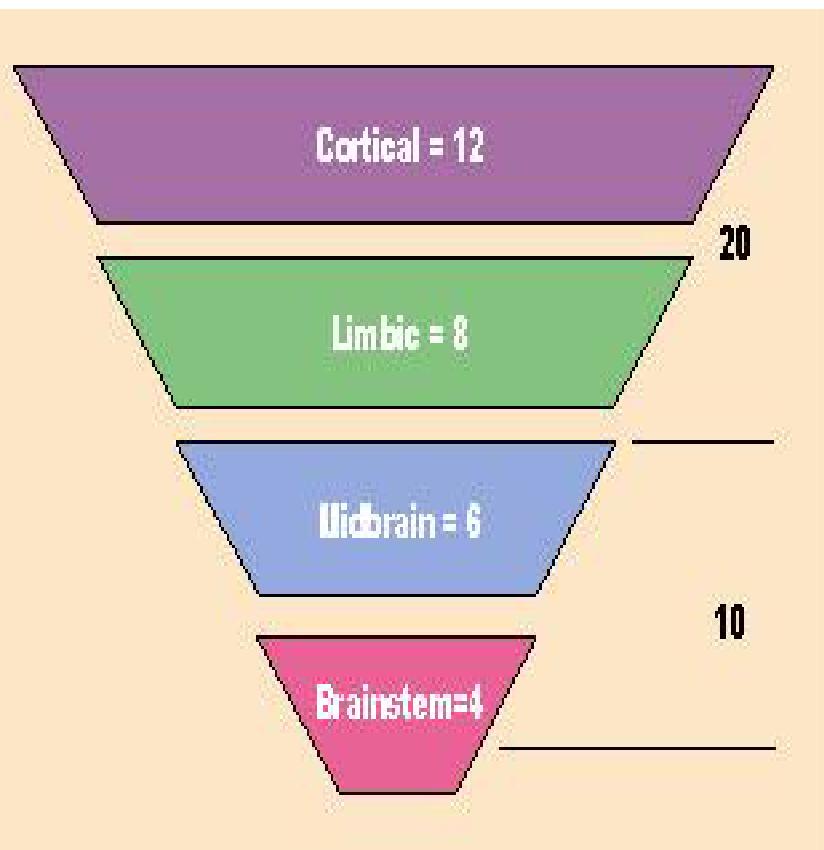
## Toxic Stress

Intense, repeated, unaddressed, absence of nurturing caregivers and supportive relationships, poor social-emotional, coping and self-regulation skills

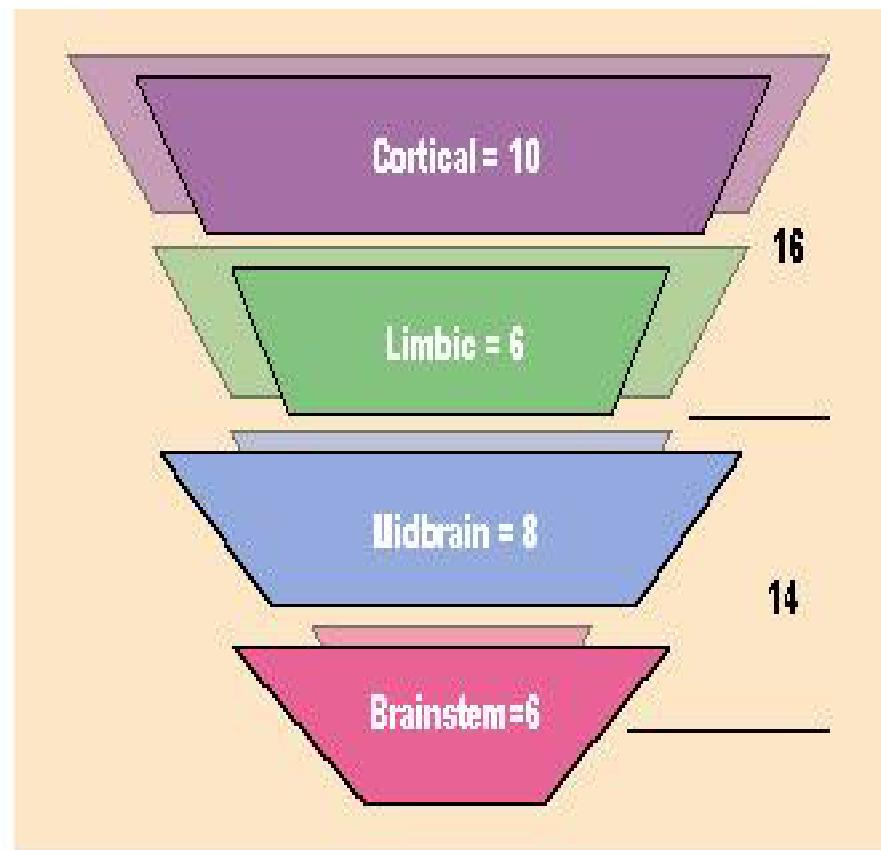
Nurturing caregivers, supportive relationships, strengthening social-emotional, coping and self-regulation skills, early intervention

# Traumatic Brain Development

## NORMAL



## TRAUMA

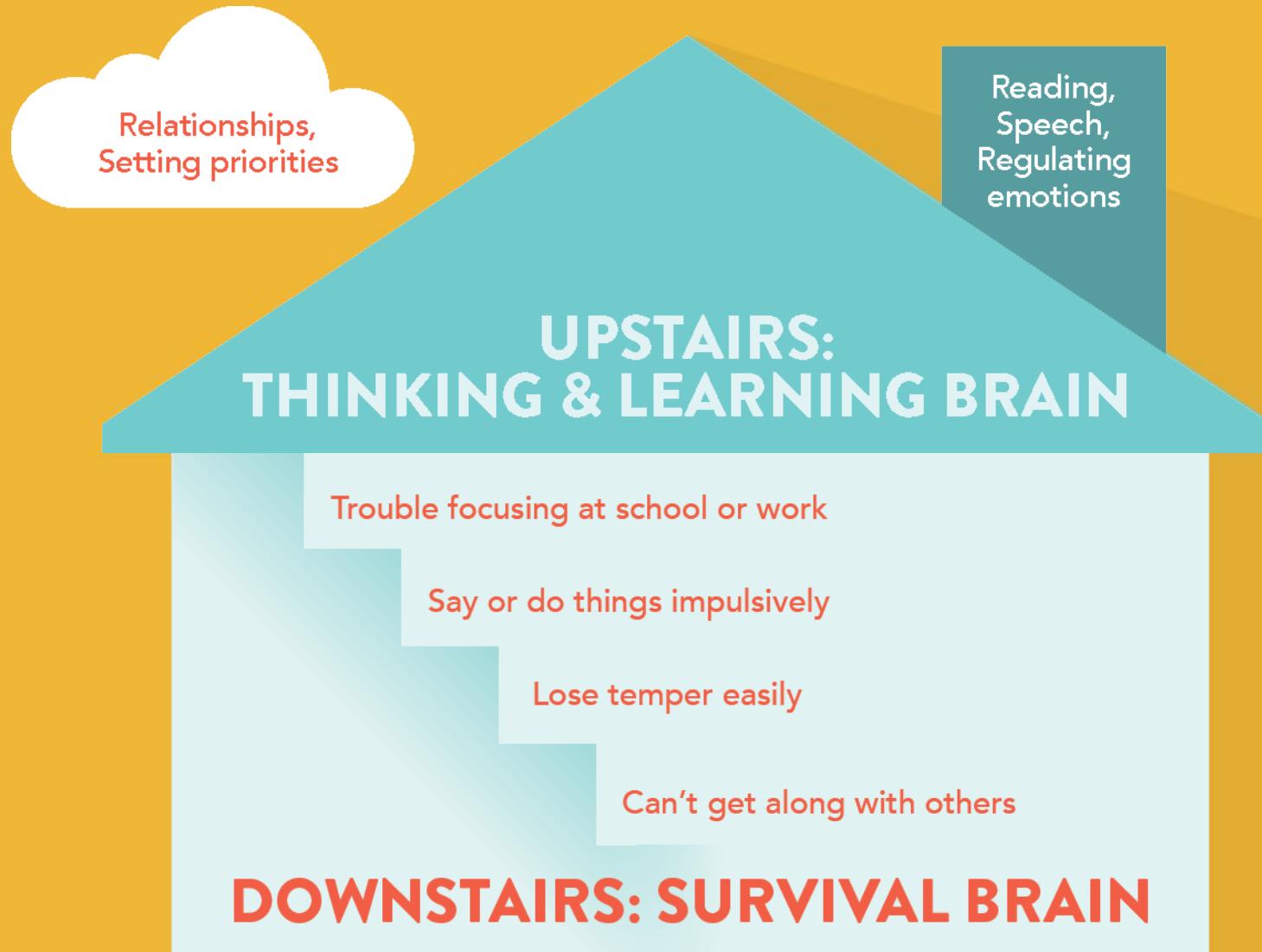


2:1 ratio

Cortical Modulation Ratio

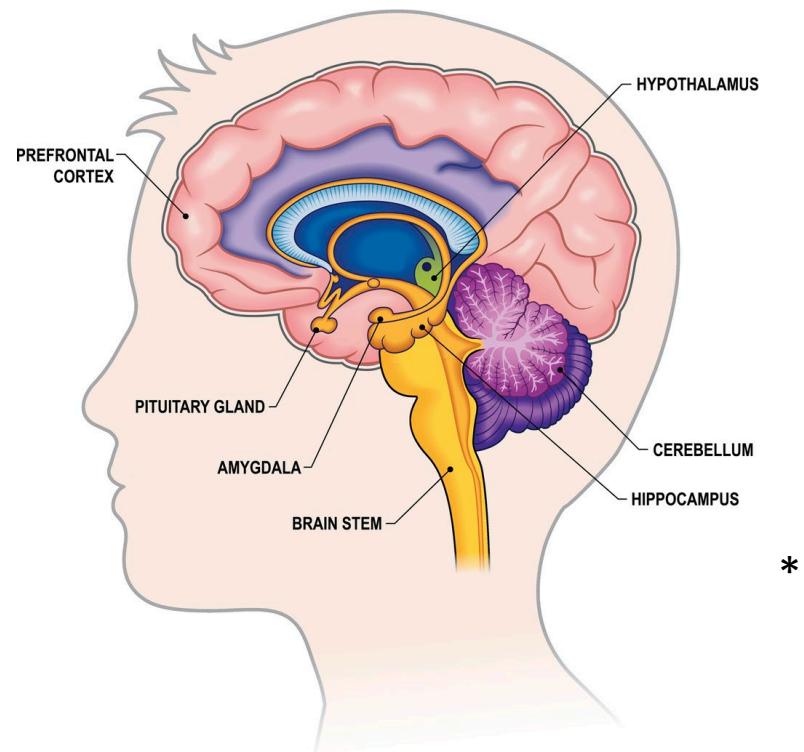
~1:1 ratio

We need to feel safe to think and learn,  
but stress can push us DOWNSTAIRS in our brain...



# Toxic Stress and the Brain

- Neural circuitry for dealing with stress is especially malleable during childhood
- Can affect hormone and neurotransmitter levels including serotonin and noradrenalin
  - Prolonged, escalated stress response





## Persistent Stress Changes Brain Architecture

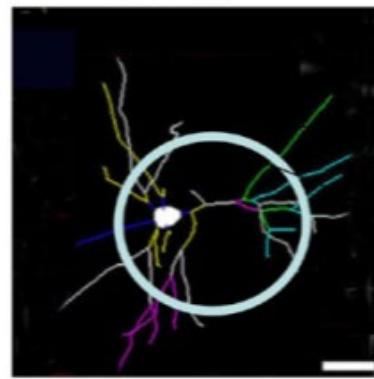
Normal



Typical neuron—  
many connections



Toxic  
stress



Damaged neuron—  
fewer connections

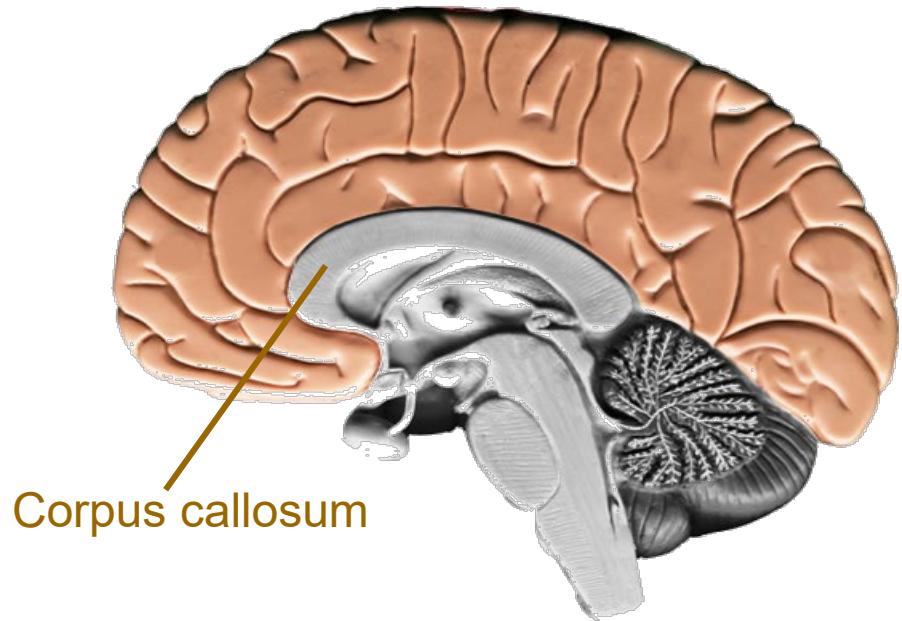


Prefrontal Cortex and  
Hippocampus

Sources: Radley et al. (2004)  
Bock et al. (2005)

# Corpus Callosum

- Neural highway connecting right and left hemispheres
- Reduced area/integrity is most consistent neurobiological finding in children and adults with history of ACEs
- Diminished right-left hemisphere integration



# What Can This Mean in Terms of Behavior

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- More impulsive, reactive brain
  - “Always on the ready”
- Less able to get to the “thinking/rationale” brain under stress
- Compromises social emotional skills
- Interferes with learning

Developmental Disconnect

# Trauma Interferes with Learning

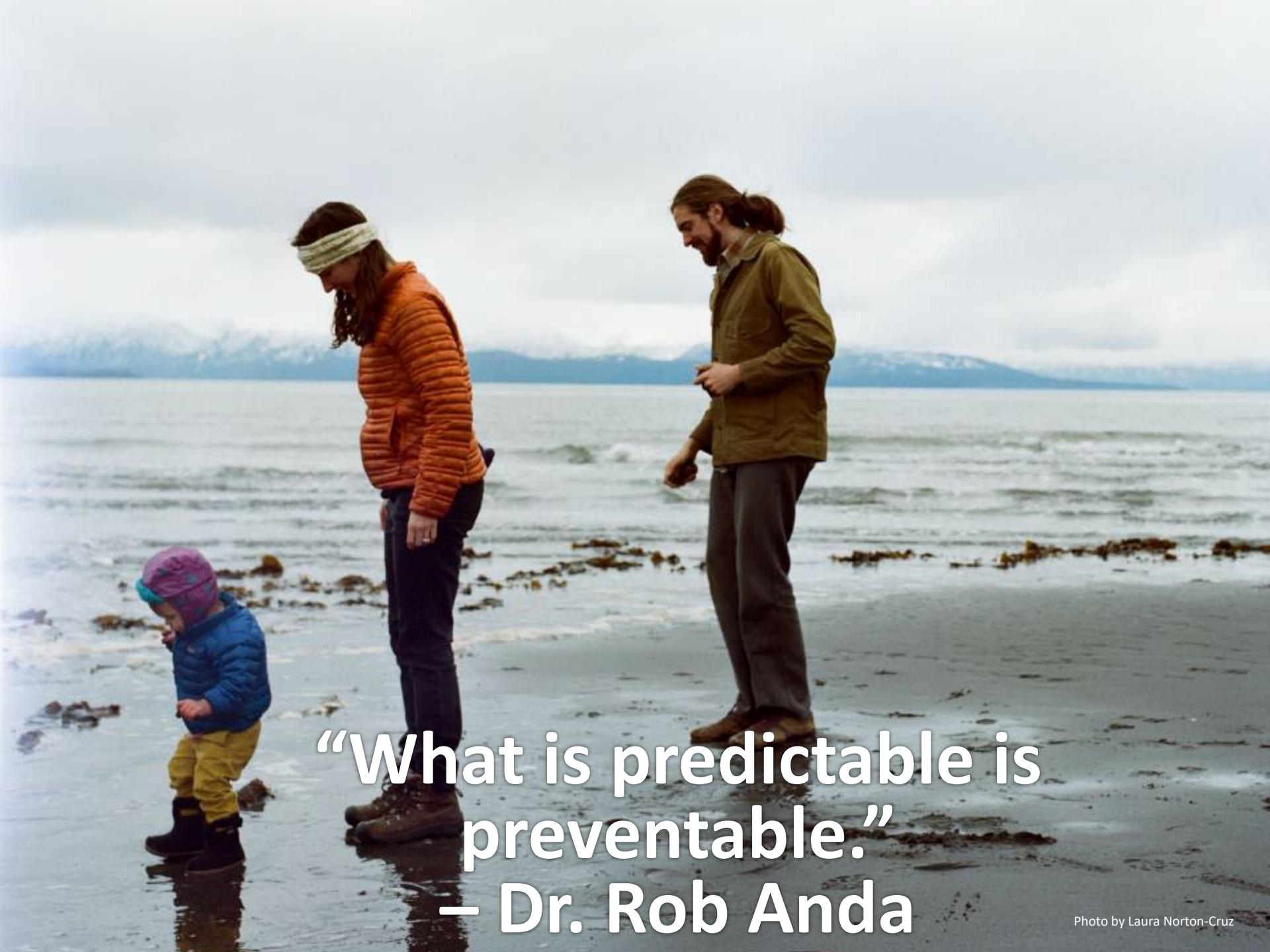
- IQ and reading ability
- Lower grade point average and ↑ days absent from school
- Significant deficits in attention, abstract reasoning, long term memory for verbal information, and decreased reading ability



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**“What is predictable is  
preventable.”**  
– Dr. Rob Anda

Photo by Laura Norton-Cruz

# Life is like an Elastic Band



# What can resilience look like?

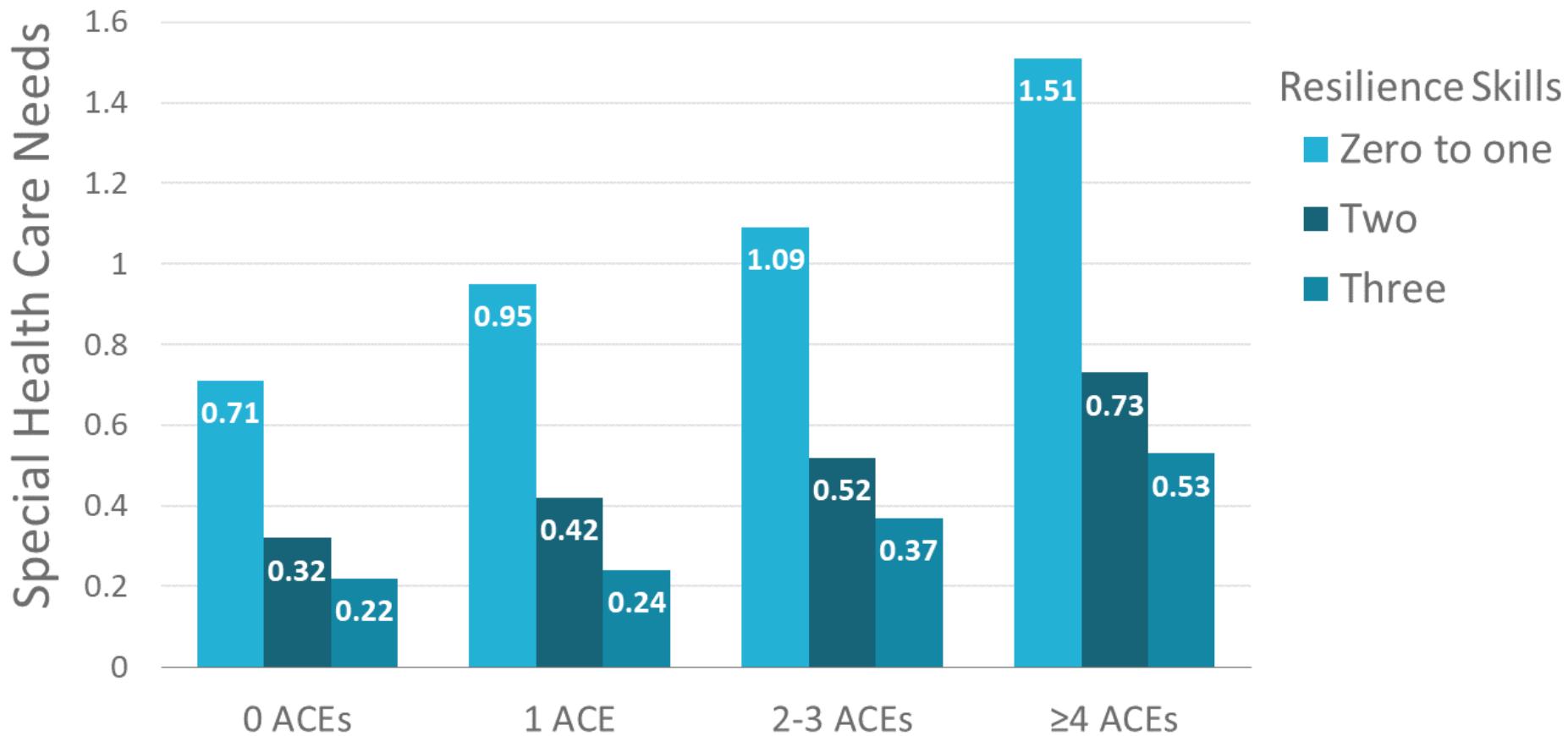


Follows  
Through



Source: Child and Adolescent Health Management Initiative (2012). "2011-2012 National Survey of Children's Health (2012), U.S. Department of Health and Human Services, Health Resources and Services Administration. Analysis done by the Alaska Mental Health Board and Advisory Board on Alcoholism and Drug Abuse Staff  
Photos by Nathaniel Wilder

# Resilience Skills Decrease Health Effects



# PRIMARY PREVENTION



# Strategies that Address the Needs of Children & their Families

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**Connect Youth to  
Caring Adults**



**Strengthen Economic  
Supports**



**Provide Quality Child Care  
& Early Education**



**Promote Culture**

# Strategies that Address the Needs of Children & their Families

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## System Navigation



## Healthy Relationships



## Enhance Parenting Skills



## Enhance Primary & Mental Health Care



alaska children's trust

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