

EARLY BRAIN &
BIOLOGICAL
DEVELOPMENT:
A SCIENCE IN
SOCIETY SYMPOSIUM

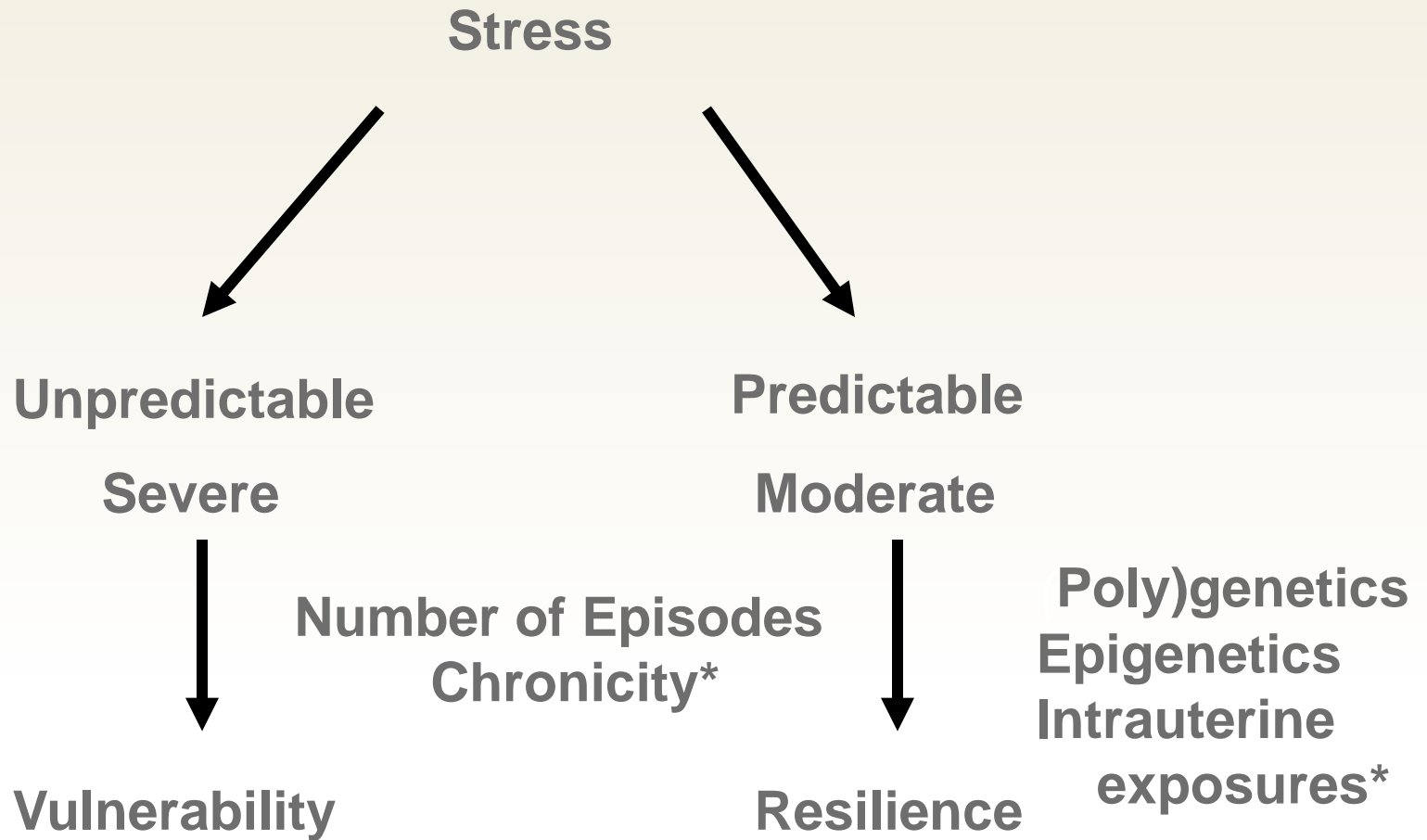
Adverse Childhood Experiences:

Connecting the Developmental Lens
to the Health of Our Society

Robert Anda, MD, MS

May 31, 2011





Death



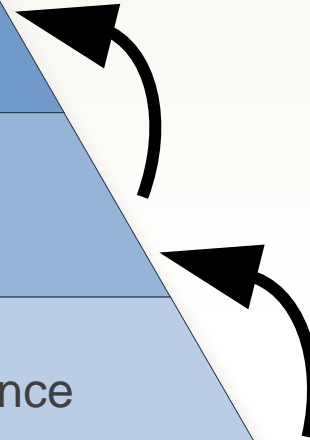
Early
Death

Disease, Disability
and Social Problems

Adoption of
Health-risk Behaviors

Social, Emotional, &
Cognitive Impairment

Adverse Childhood Experience



Scientific
gaps

Conception

What do we mean by Adverse Childhood Experiences?

10 categories of experience up to 18 years old

•childhood abuse

- emotional, physical, or sexual

•childhood neglect

- emotional or physical

•growing up with:

- domestic violence
- substance abuse (alcohol or drugs)
- mental illness
- parental discord
- crime



The Adverse Childhood Experiences (ACE) Study

1) Examines the health and social effects of ACEs
throughout the lifespan

2) Studied among 17,421 members of the Kaiser Health
Plan in San Diego County



ACE Study Design

Survey Wave I
(N=9,508)

Survey Wave II

Follow-up

N = 17,421

Mortality
National Death Index
Morbidity

Hospital Discharge
Outpatient Visits
Emergency room
visits
Pharmacy Utilization

All medical evaluations
abstracted from both waves



Adverse Childhood Experiences Are Common

Household Disfunction:

Substance abuse	27%
Parental sep/divorce	23%
Mental illness	17%
Battered mother	13%
Criminal behavior	6%

Abuse:

Psychological	11%
Physical	28%
Sexual	21%

Neglect:

Emotional	15%
Physical	10%



Adverse Childhood Experiences Rarely Occur in Isolation...

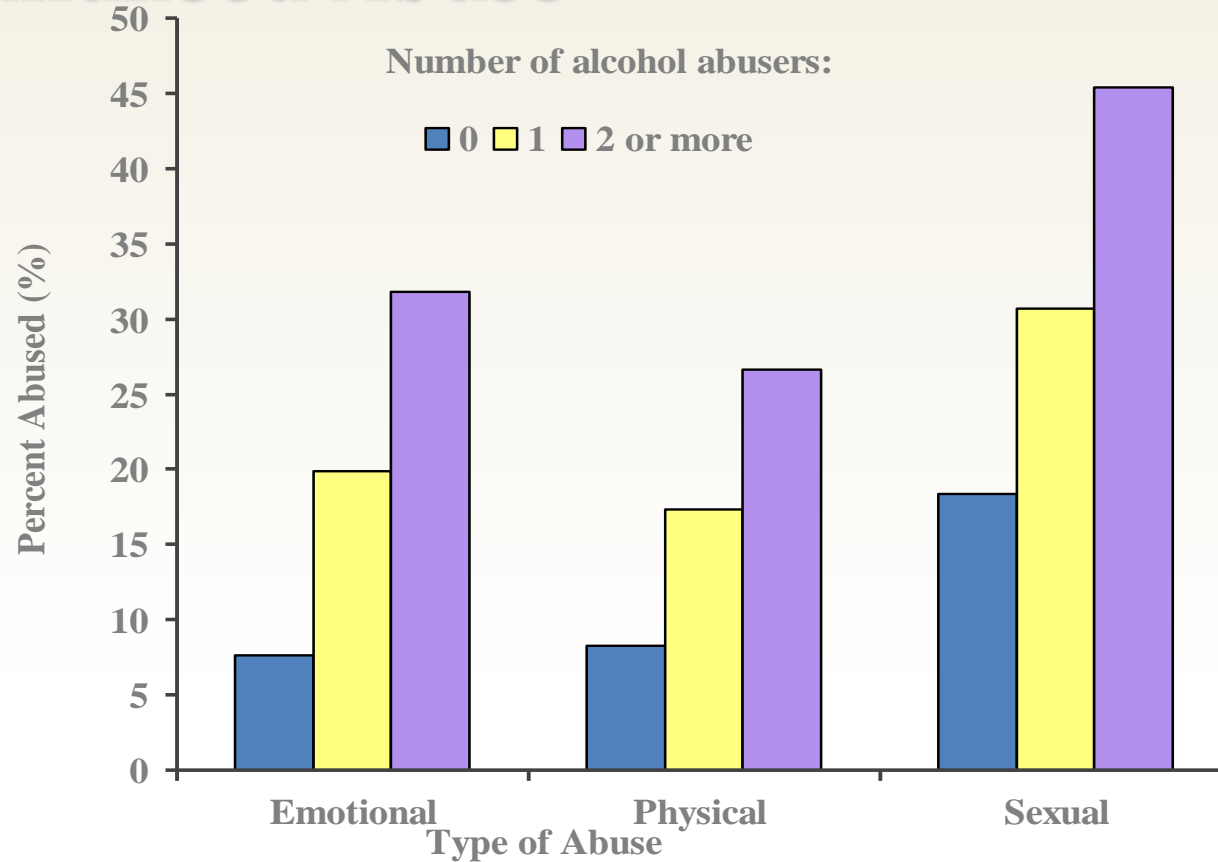
They come in groups.



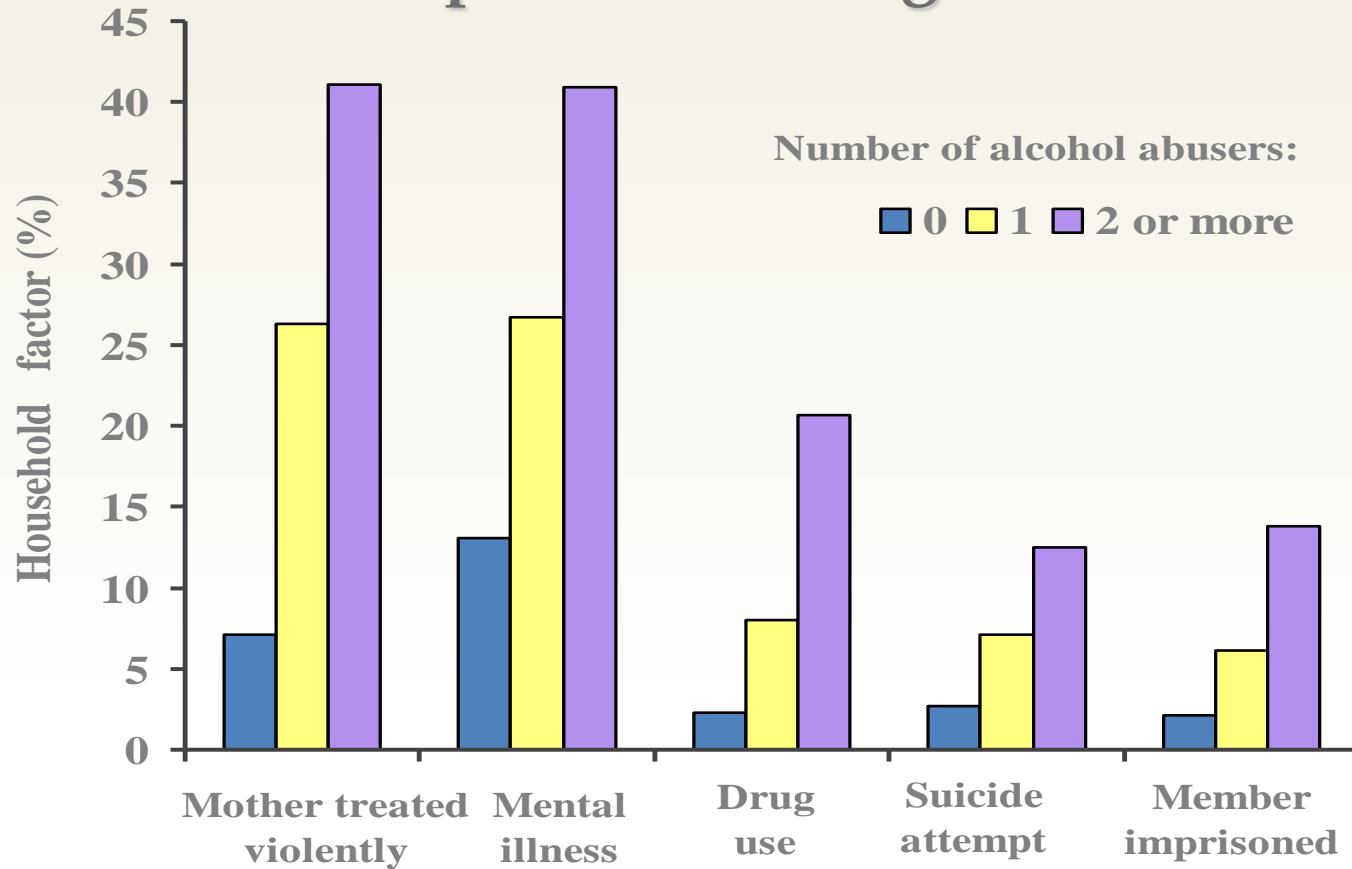
Alcohol Abuse in the Home and the Risk of Other ACEs...



Alcohol Abuse in the Home and the Risk of Childhood Abuse



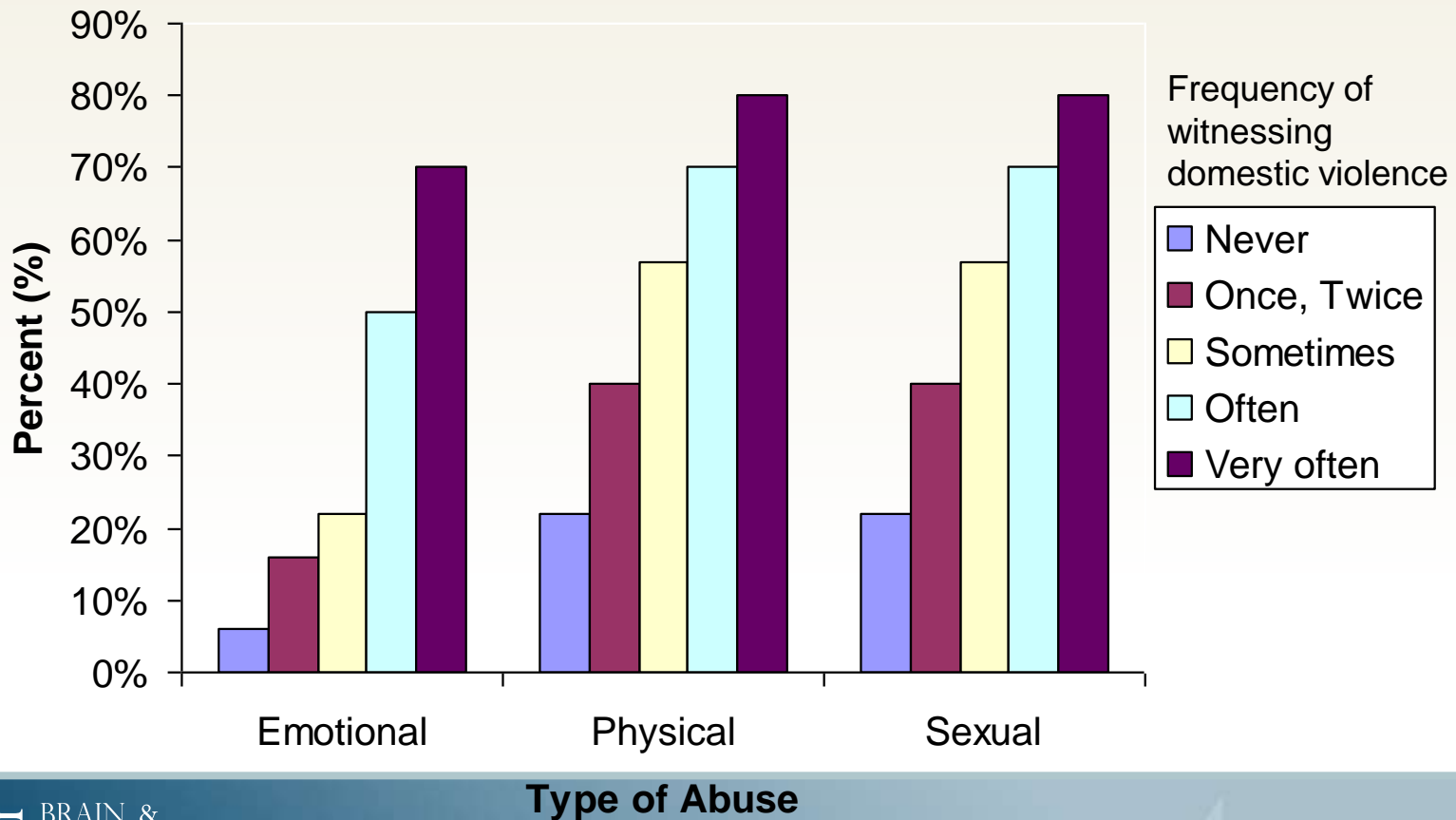
Alcohol Abuse in the Home and the Risk of Other Household Exposures During Childhood



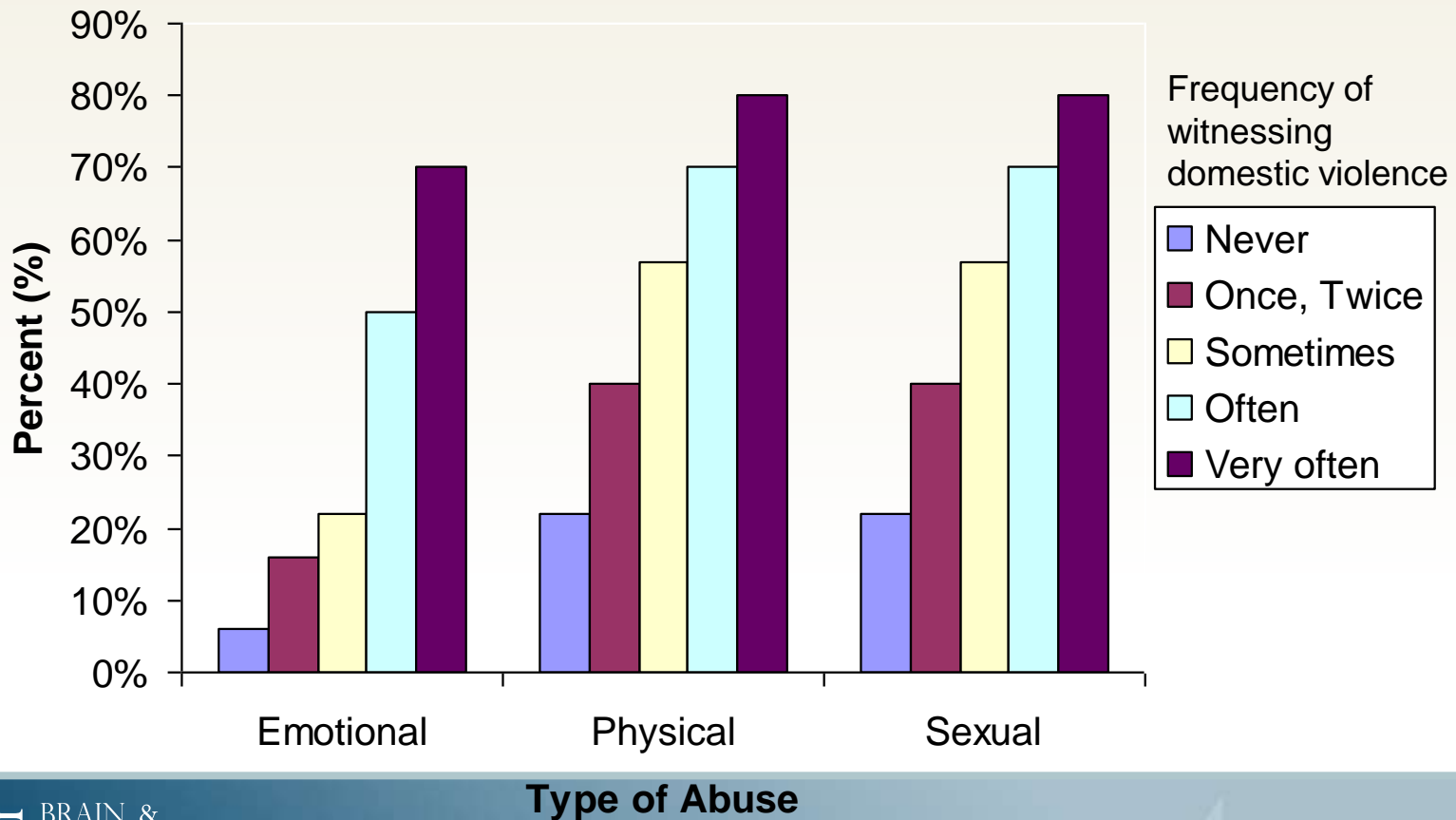
Domestic Violence and the Risk of Other ACEs...



Prevalence of Childhood Abuse by Frequency of Witnessing Domestic Violence



Prevalence of Childhood Abuse by Frequency of Witnessing Domestic Violence



ACEs tend to come in groups...

	Additional ACEs (%)				
	1	2	3	4	>5
If you had:					
A battered mother	95	82	64	48	52



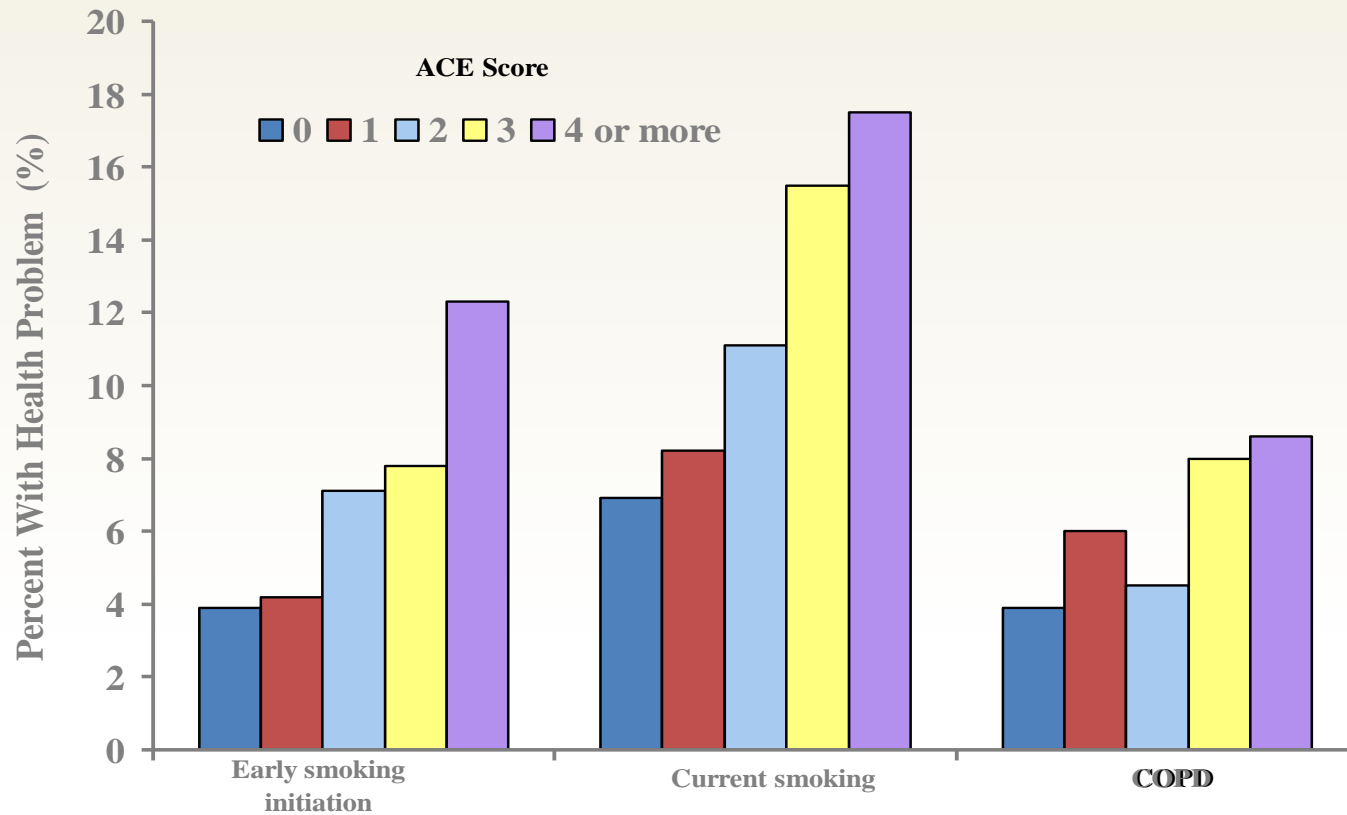
Adverse Childhood Experiences Score Complex Trauma--Trauma “Dose”

Number of individual types of adverse childhood experiences were summed...

<u>ACE score</u>	<u>Prevalence</u>
0	33%
1	26%
2	16%
3	10%
4 or more	16%

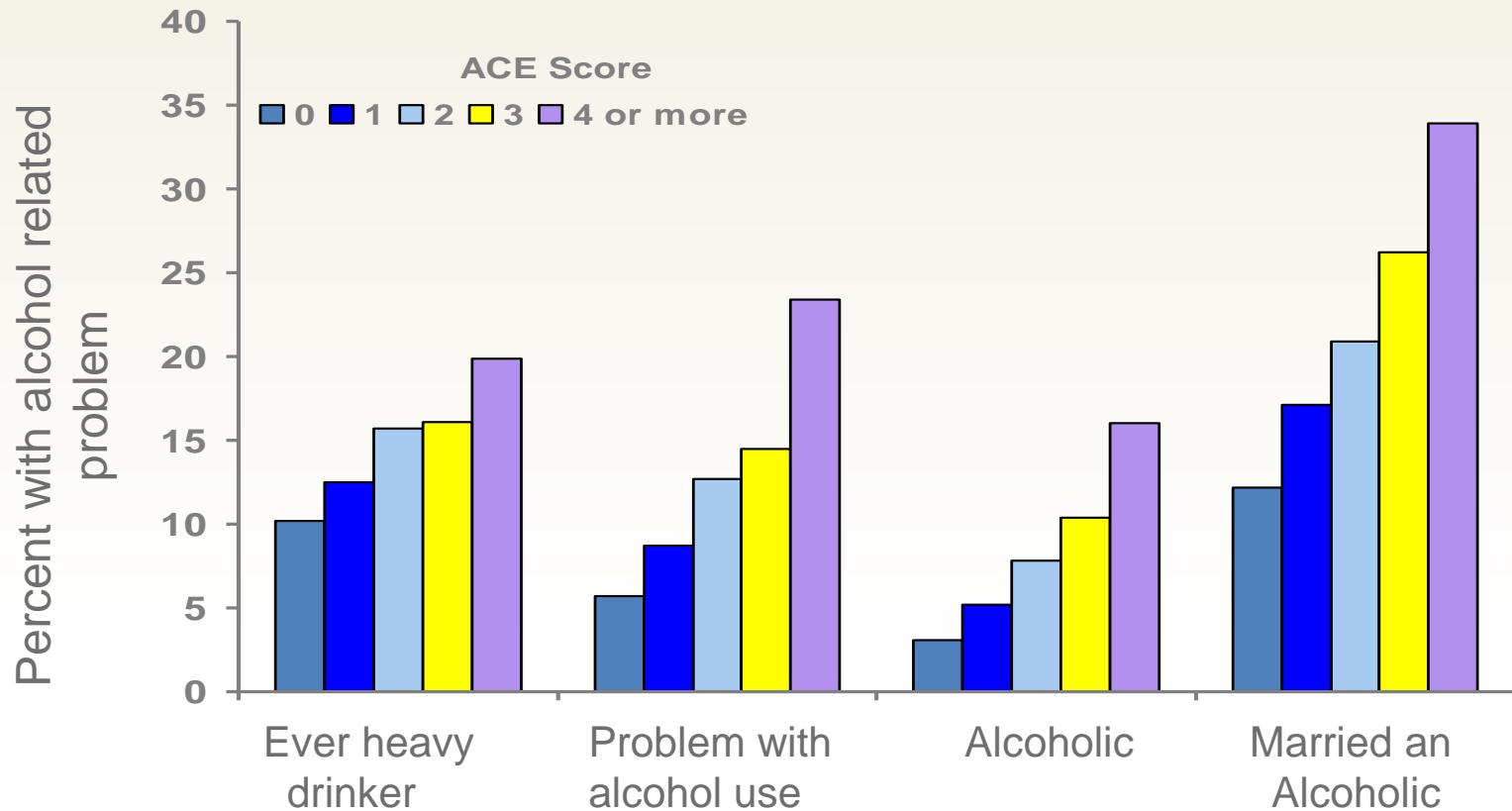


The ACE Score, Smoking, and Lung Disease

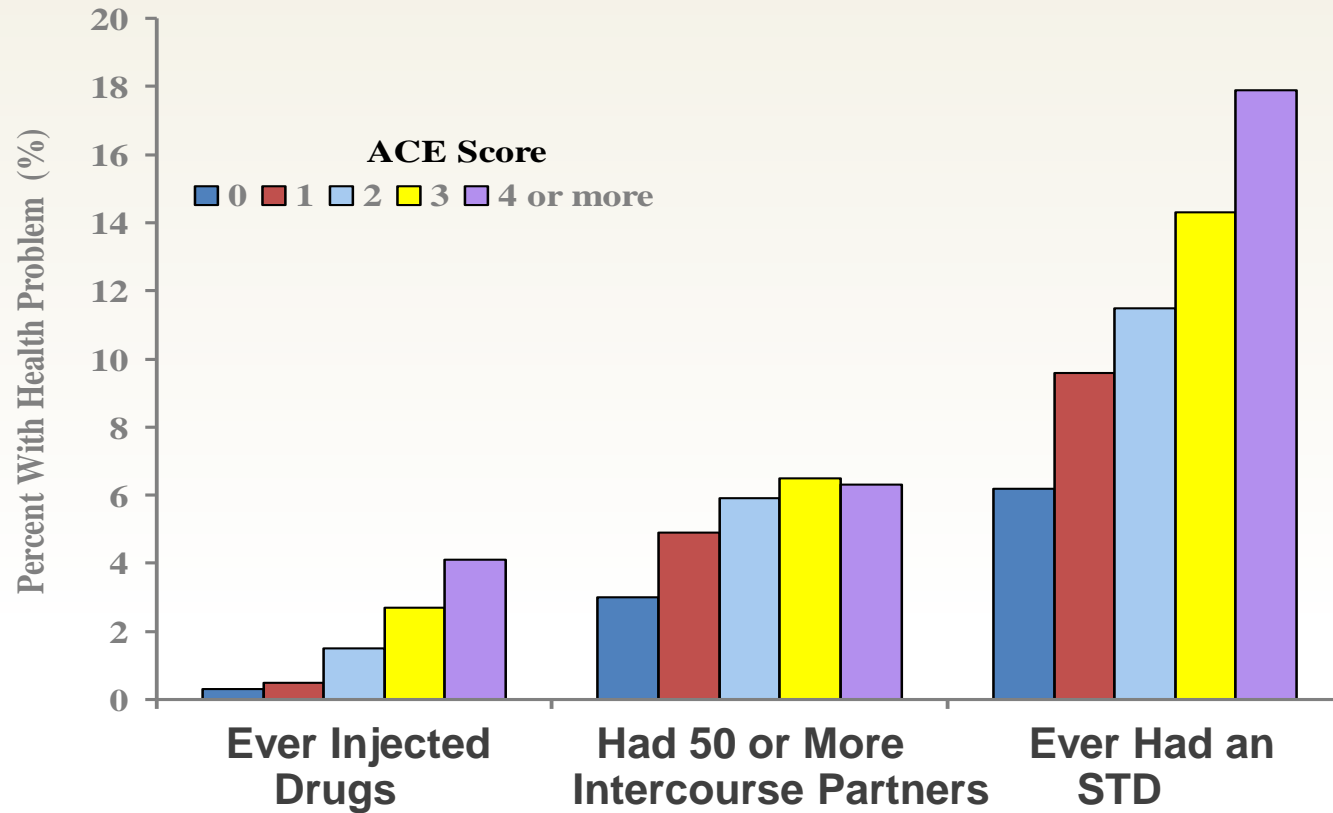


The ACE Score...

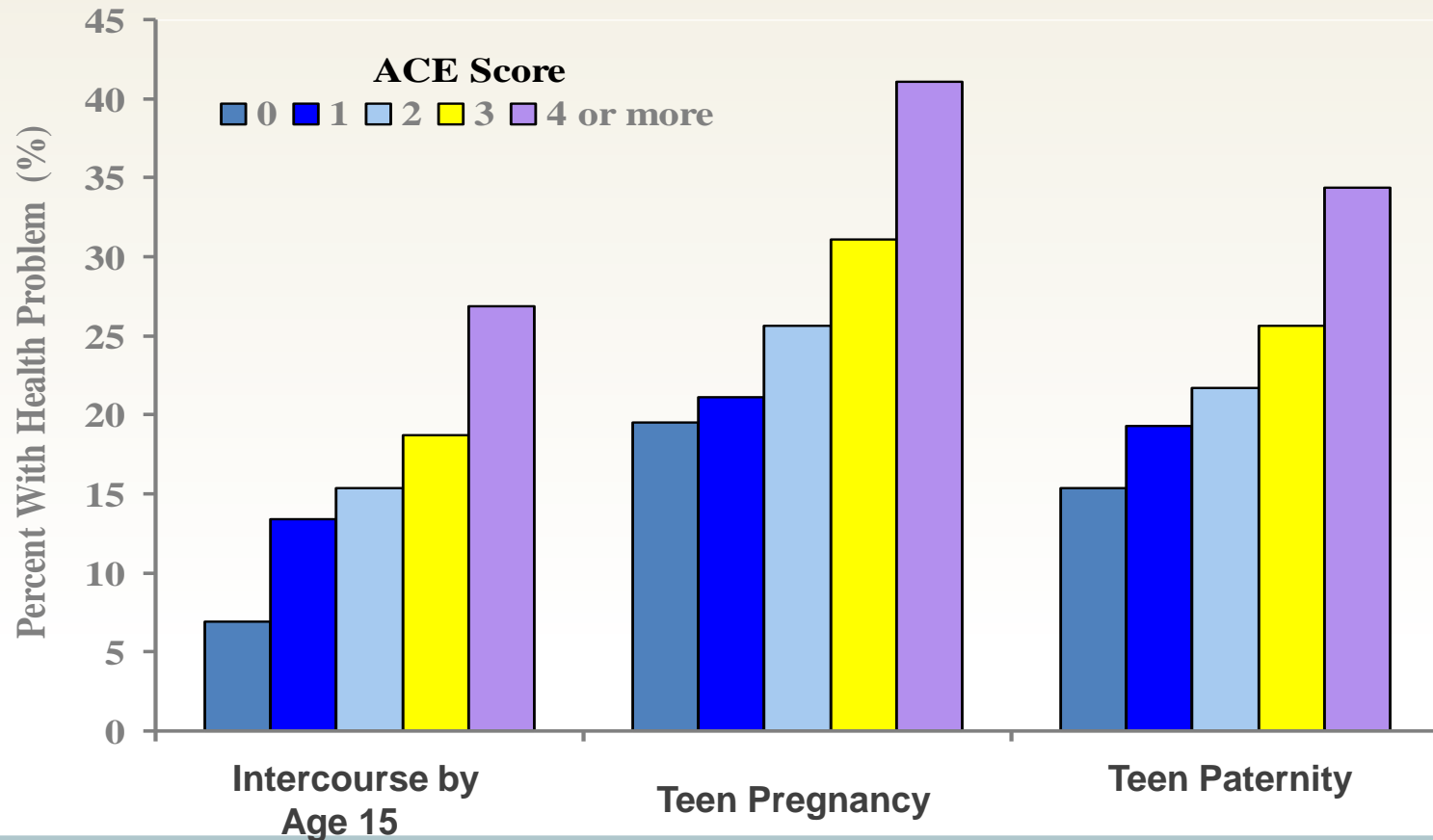
Alcohol Use and Abuse



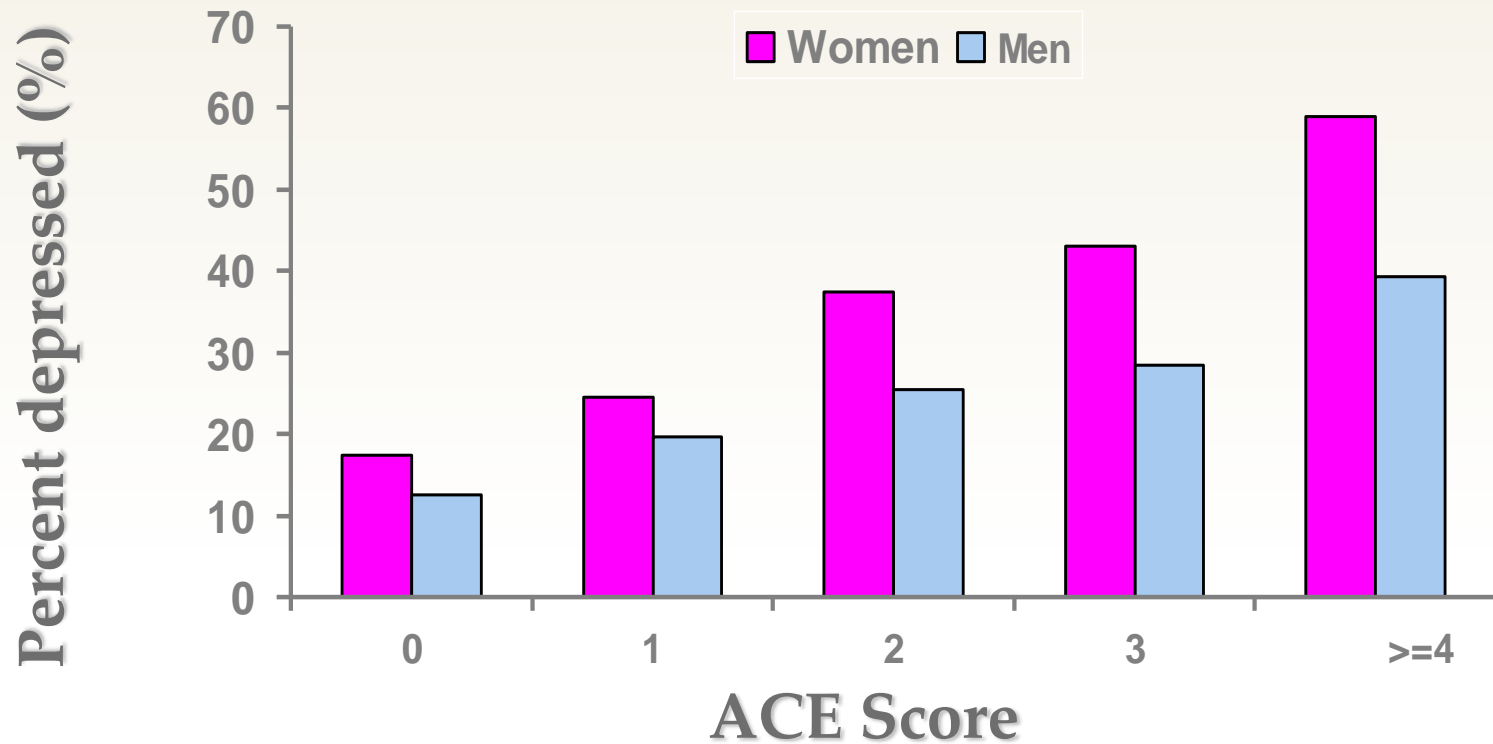
ACE Score and HIV Risks



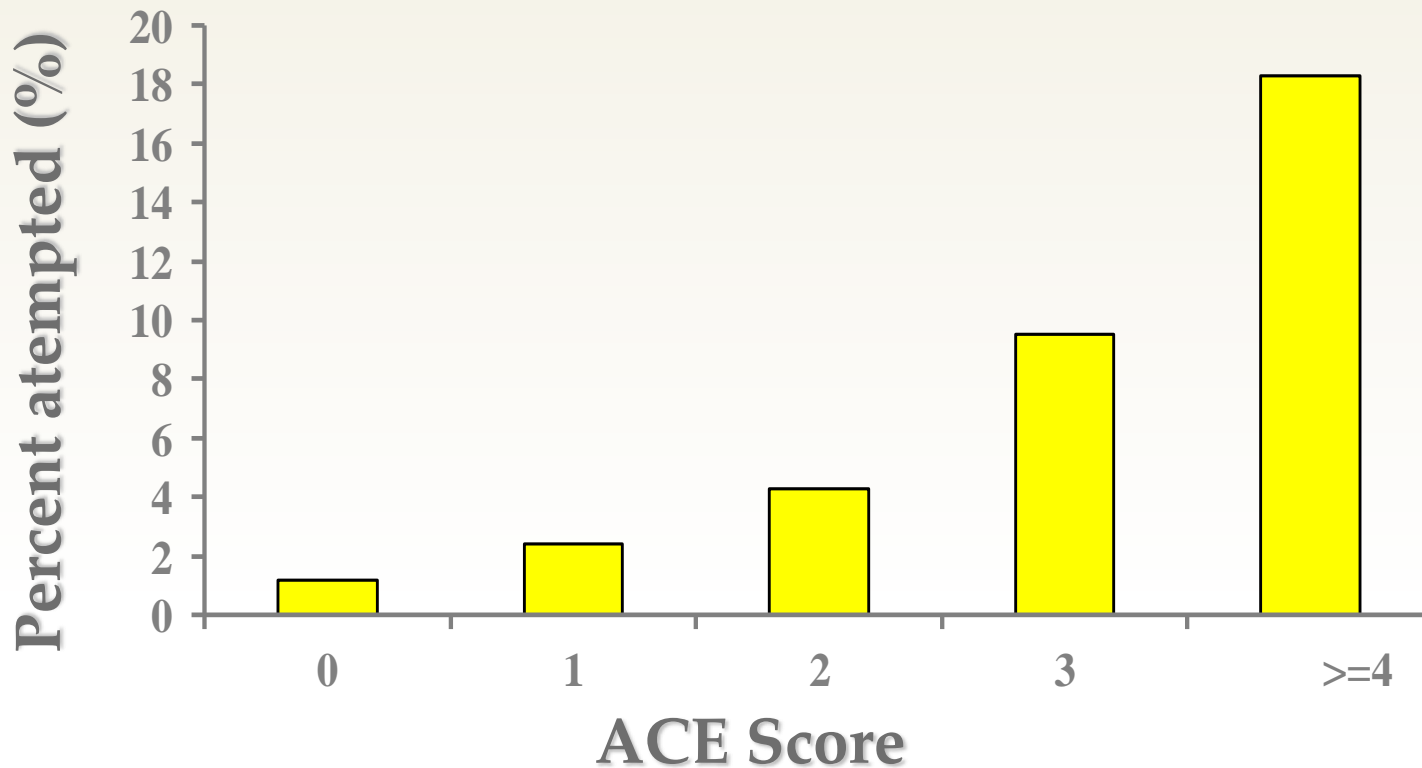
ACE Score and Teen Sexual Behaviors



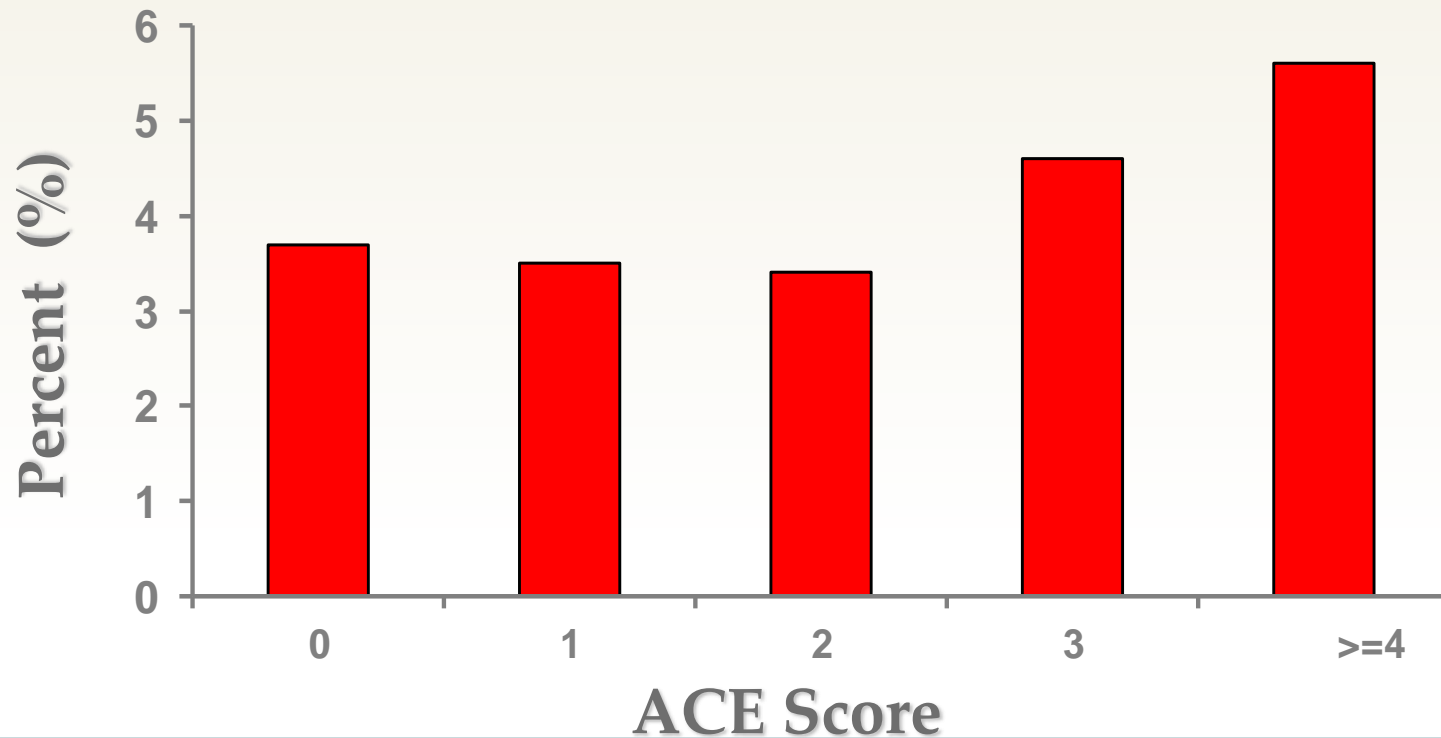
The ACE Score and a Lifetime History of Depression



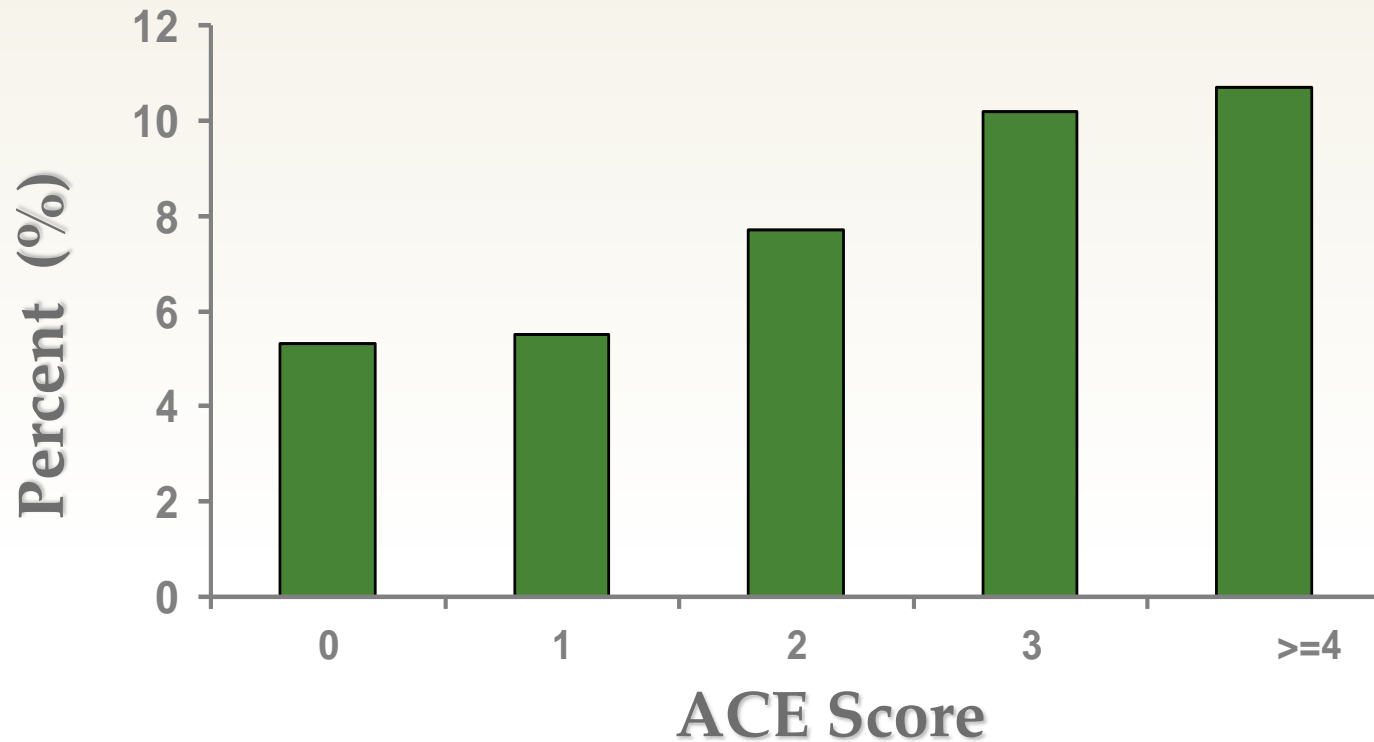
The ACE Score and the Prevalence of Attempted Suicide



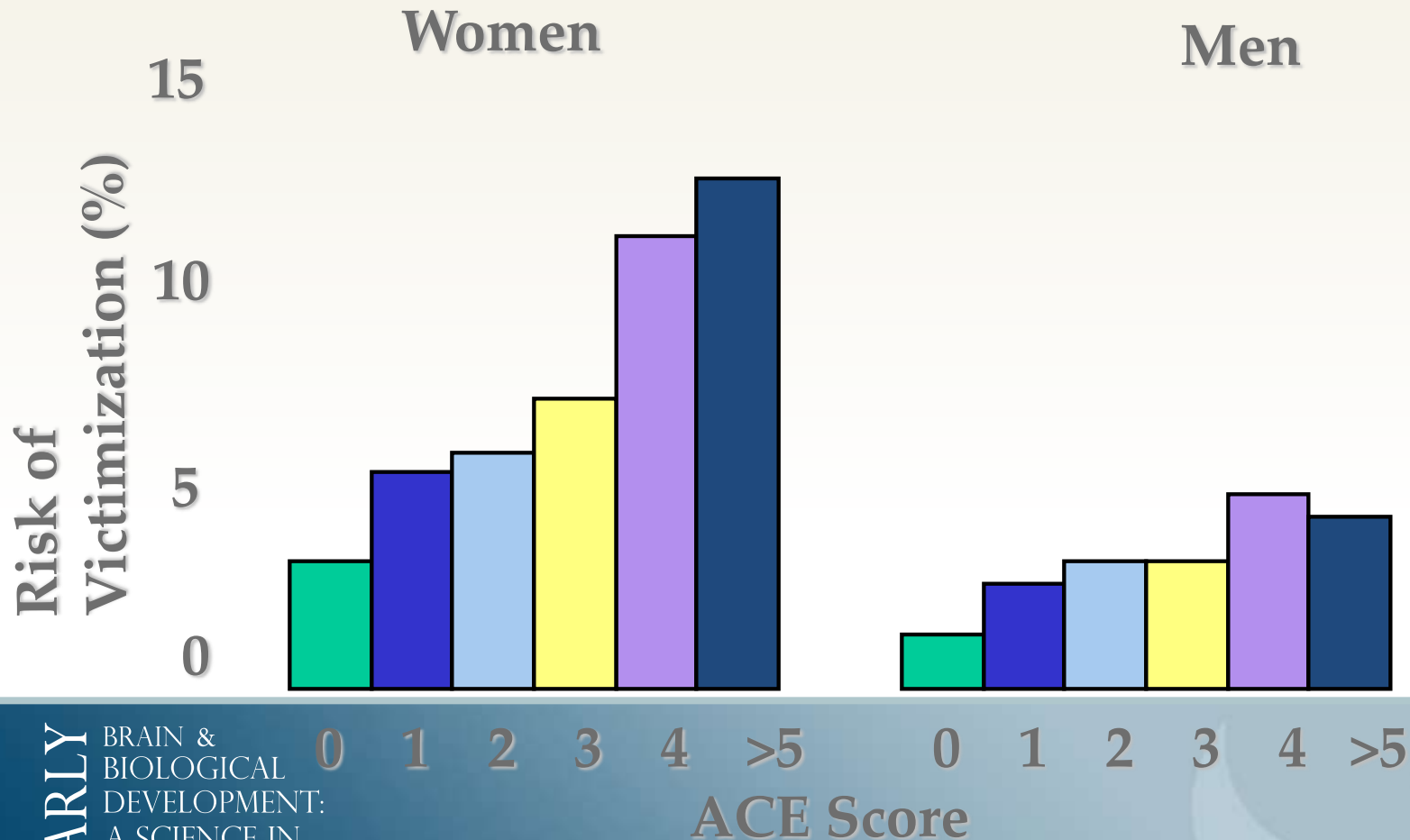
The ACE Score and the Prevalence Ischemic Heart Disease



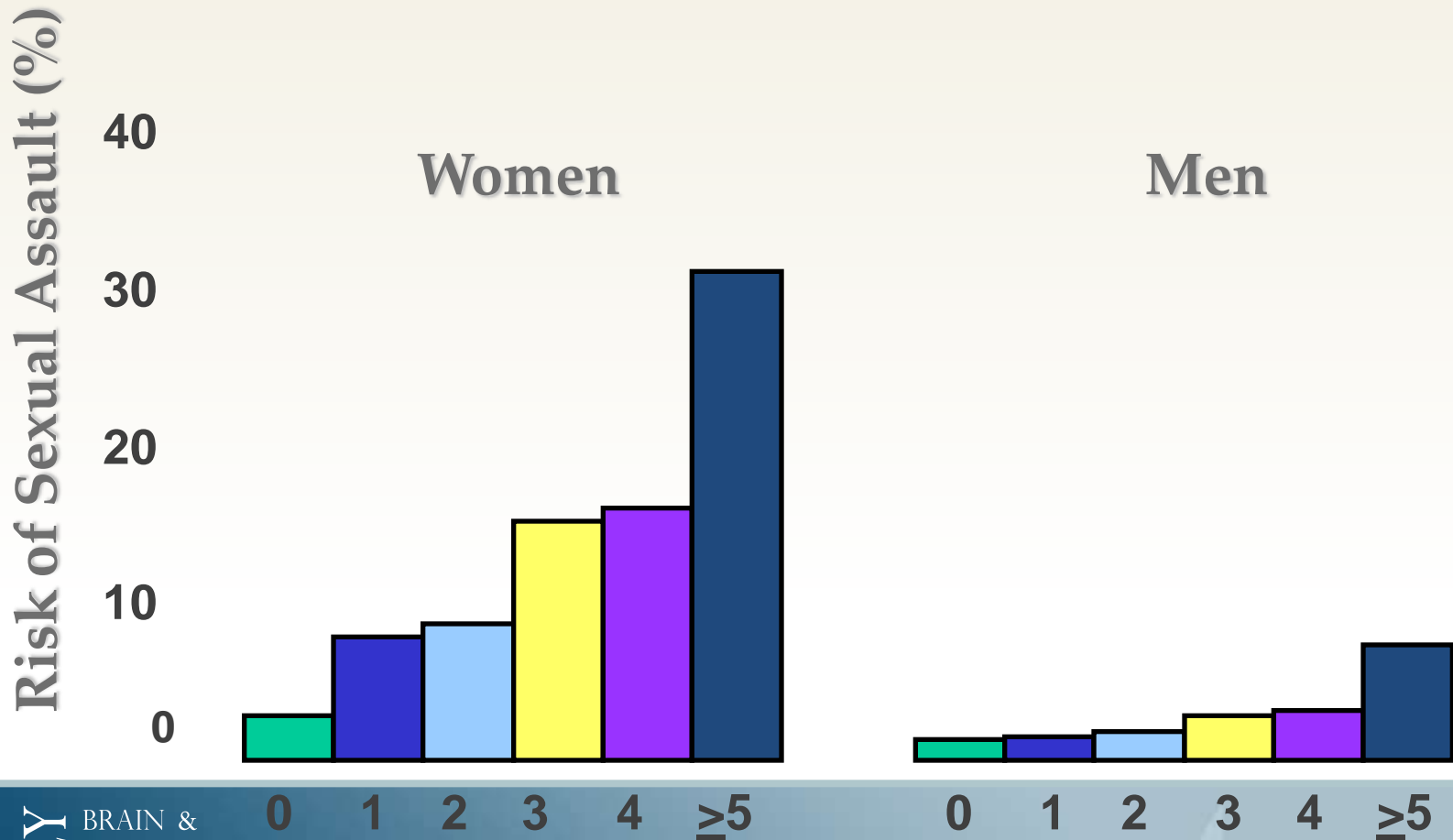
The ACE Score and the Prevalence of Liver Disease (Hepatitis/Jaundice)



ACE Score and the Risk of Being a Victim of Domestic Violence



ACE Score and the Risk of Being Sexually Assaulted as an Adult

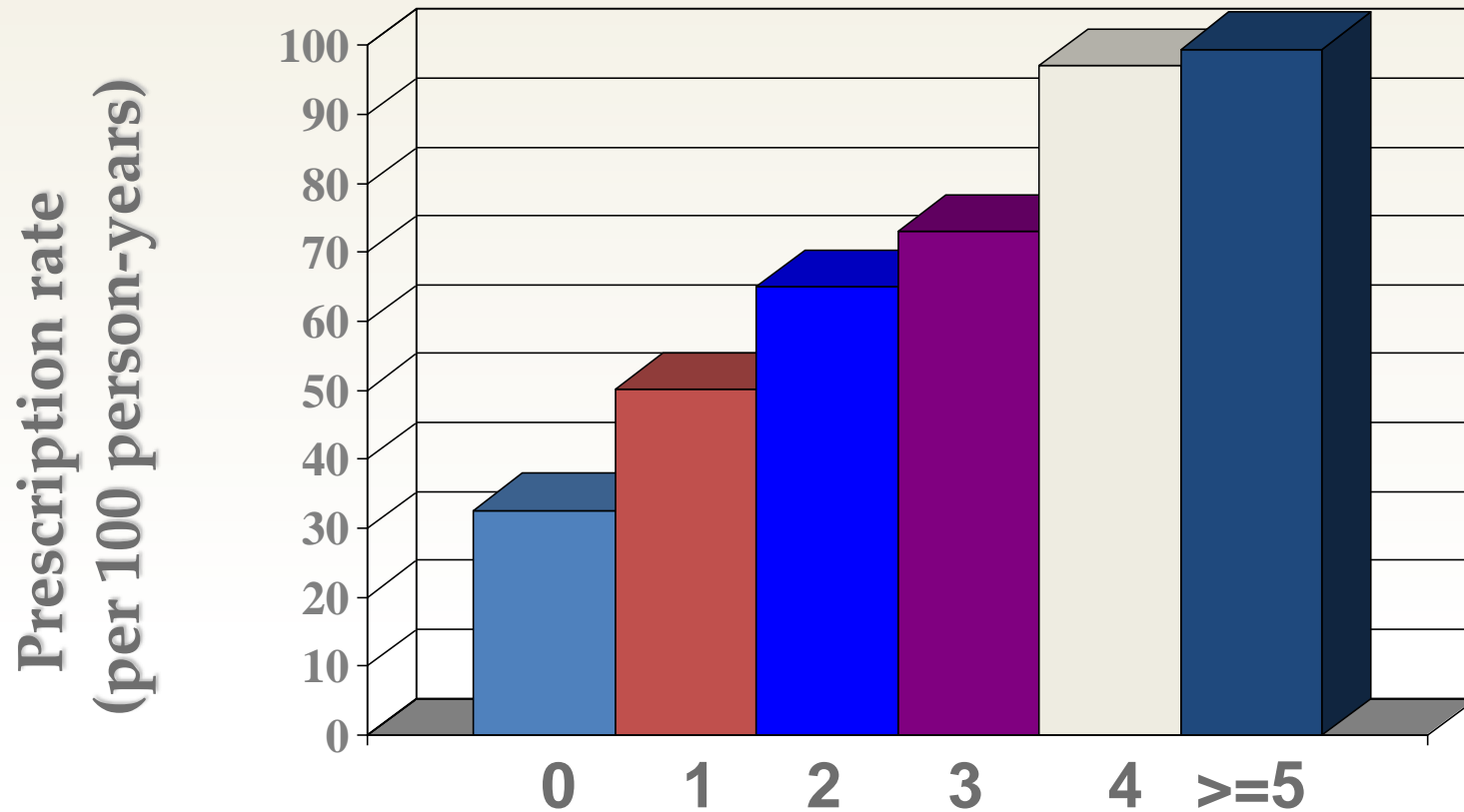


Prescription Drugs in the United States (2003)

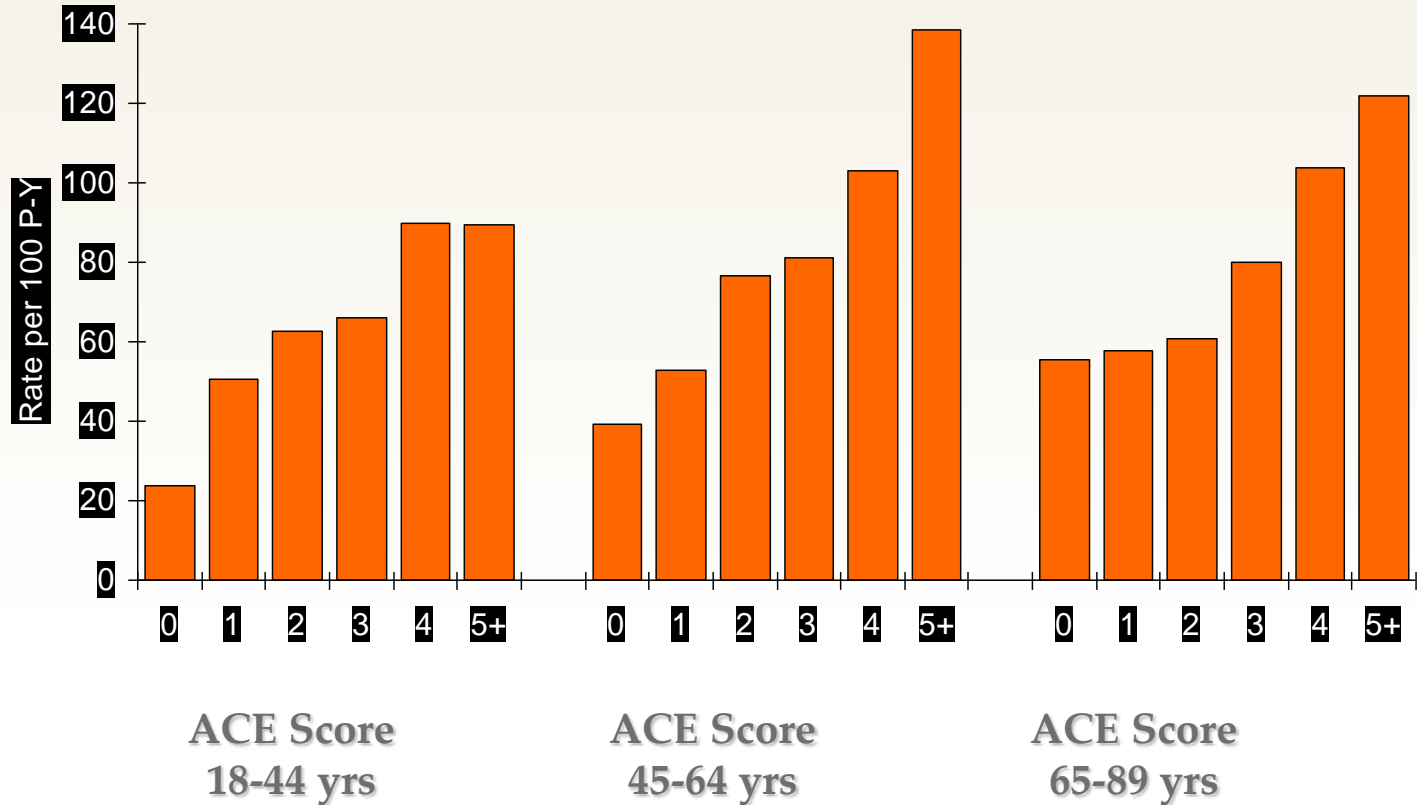
- **Nearly \$180 billion spent**
- **11% of total national health expenditures**
- **More than four times the amount spent in 1990**



ACE Score and Rates of Antidepressant Prescriptions



ACE Score and Rates of Prescribed Antidepressant Medications by Age, 1997-2004



Brain Development Key Points

1. The brain develops from the most primitive functions to the most complex
2. Normal development of systems and functions they mediate requires specific signals at specific times
3. These critical periods are times of sensitivity to environmental input—including traumatic experience
4. Different functions (regulation of anxiety, mood, abstract thought) develop or mature at different times in the life of a child

**Does the ACE Score Have a Graded Relationship
to the Number
of Neurobiological Manifestations?**



ACEs Effect An Array of Brain Functions

Affect Regulation

- Panic reactions, depression, anxiety, hallucinations

Somatic Issues

- Sleep disturbances, severe obesity, somatization

Substance Use

- Smoking, alcoholism, illicit drug use, IV drug use

Sexuality

- Early intercourse, promiscuity, sexual dissatisfaction

Memory

- Amnesia (childhood)

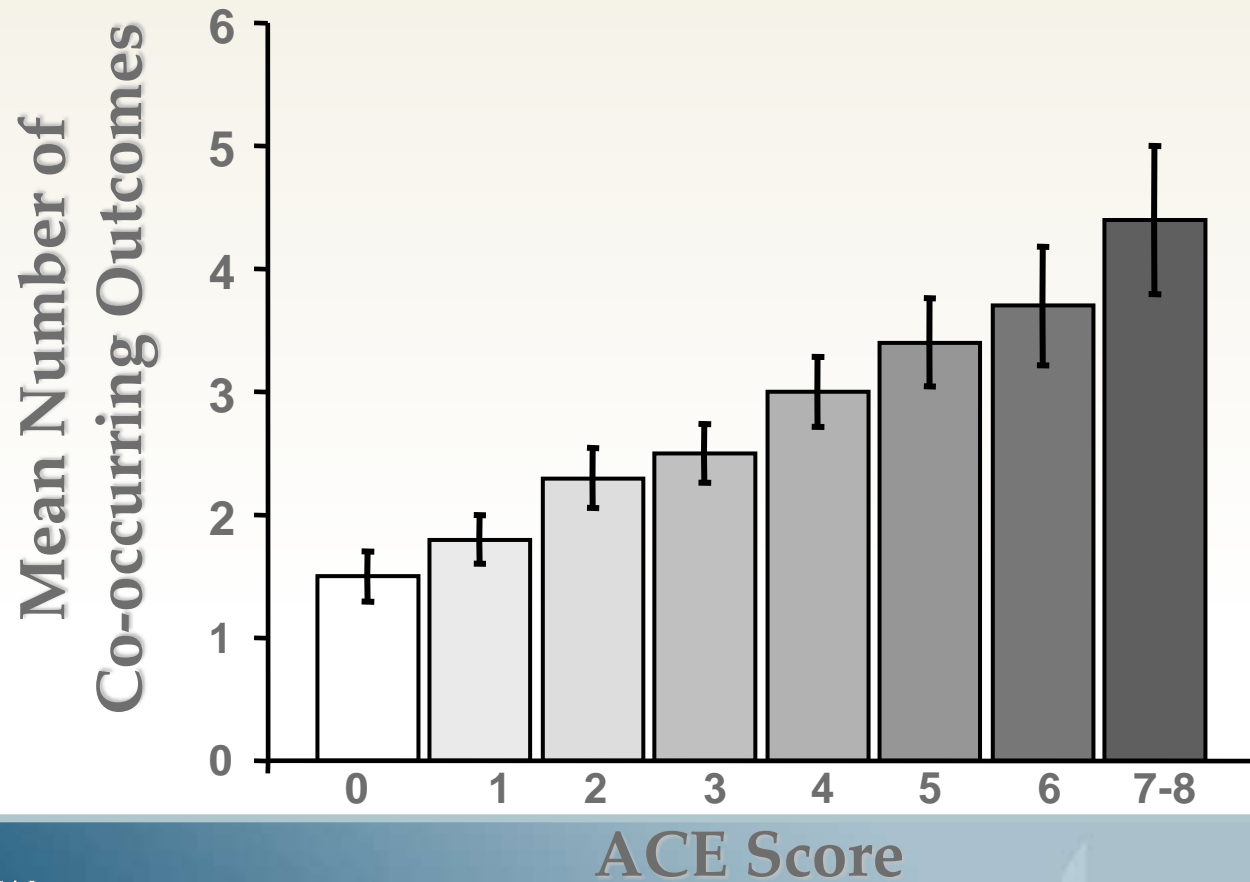
Arousal

- High stress, problems with anger, perpetrating domestic violence



Neurobiology and Epidemiology Converge

Complex Trauma – Trauma Spectrum Disorders and the mean number of a variety of problems



Implications:

ACEs appear to affect multiple brain systems and functions. This leads to multiple problems in different health and social domains.

Trauma Spectrum Disorder



Adverse Childhood Experiences As a National Health Issue

ACEs have a strong influence on:

- adolescent health
- reproductive health
- smoking
- alcohol abuse
- illicit drug abuse
- sexual behavior
- mental health
- risk of revictimization
- stability of relationships
- performance in the workforce



Adverse Childhood Experiences As a National Health Issue

ACEs increase the risk of:

- Heart disease
- Chronic Lung disease
- Liver disease
- Suicide
- Injuries
- HIV and STDs and other risks for the leading causes of death



Bridging The Chasm

Child
health
as it
stands
today



Intergenerational Care

Consolidation and
Coordination

Child
and
Adult
health
as it
could
be



Bridging The Chasm



Child
health
as it
stands
today

**Breakthroughs in molecular genetics and
biology:**

Mental illness
Substance abuse
Violence

Improved recognition and treatment of:

Mental illness
Substance abuse
Domestic violence
Child abuse

Child
and
Adult
health
as it
could
be



Bridging The Chasm



Child
health
as it
stands
today

Mass education about child
development & parenting:

Media
Schools

Promoting Healthy neurodevelopment
through better early childhood
development (Promoting Resilience)

Child
and
Adult
health
as it
could
be



Bridging The Chasm



Child
health
as it
stands
today

Harnessing Brain Plasticity
To Overcome the Effects
of Adversity
(Secondary Resilience or Recovery)

Child
and
Adult
health
as it
could
be

Documenting the
societal burden of
child health as it
stands today



New directions in
prevention,
treatment, and
policy



For More Information

acestudy.org
cdc.gov/nccdphp/ace



This is an Example of a Title

This is an example of a text box in paragraph form, with the copy spreading onto multiple lines. Can put as many words as one may like here.

This is an example of a bullet list:

- Bullet item number 1
- Bullet item number 2
- Bullet item number 3

SECTION 1: This is the Section Footer



EARLY BRAIN &
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