

# The Relationship of Adverse Childhood Experiences to Adult Health Status

**A collaborative effort of Kaiser Permanente and The Centers for Disease Control**

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# The Adverse Childhood Experiences (ACE) Study

- **The largest study of its kind ever done to examine the health and social effects of adverse childhood experiences over the lifespan (18,000 participants)**



## What do we mean by Adverse Childhood Experiences?

- **Experiences that represent medical and social problems of national importance.**
  - **childhood abuse and neglect**
  - **growing up with domestic violence, substance abuse or mental illness in the home, parental loss, or crime**



# ACE Study Design

Survey Wave 1 -- complete  
71% response (9,508/13,454)

n=15,000  
71% response  
*All medical evaluations  
abstracted*

vs.

*Present  
Health Status*

& →

Mortality

National Death Index

Morbidity

Hospital Discharge

Outpatient Visits

Emergency Room Visits

Pharmacy Utilization

Survey Wave II

n=15,000

*All medical evaluations  
abstracted*

# The Adverse Childhood Experiences (ACE) Study

## Summary of Findings:

- **Adverse Childhood Experiences (ACEs) are very common**
- **ACEs are strong predictors of later health risks and disease**
- **This combination makes ACEs *the leading* determinant of the health and social well-being of our nation**



# Categories of Adverse Childhood Experiences

|                                    | Category Prevalence (%) |
|------------------------------------|-------------------------|
| <hr/>                              |                         |
| Abuse, by Category                 |                         |
| Psychological (by parents)         | 11%                     |
| Physical (by parents)              | 11%                     |
| Sexual (anyone)                    | 22%                     |
|                                    |                         |
| Household Dysfunction, by Category |                         |
| Substance Abuse                    | 26%                     |
| Mental Illness                     | 19%                     |
| Mother Treated Violently           | 13%                     |
| Imprisoned Household Member        | 3%                      |

# Adverse Childhood Experiences Score

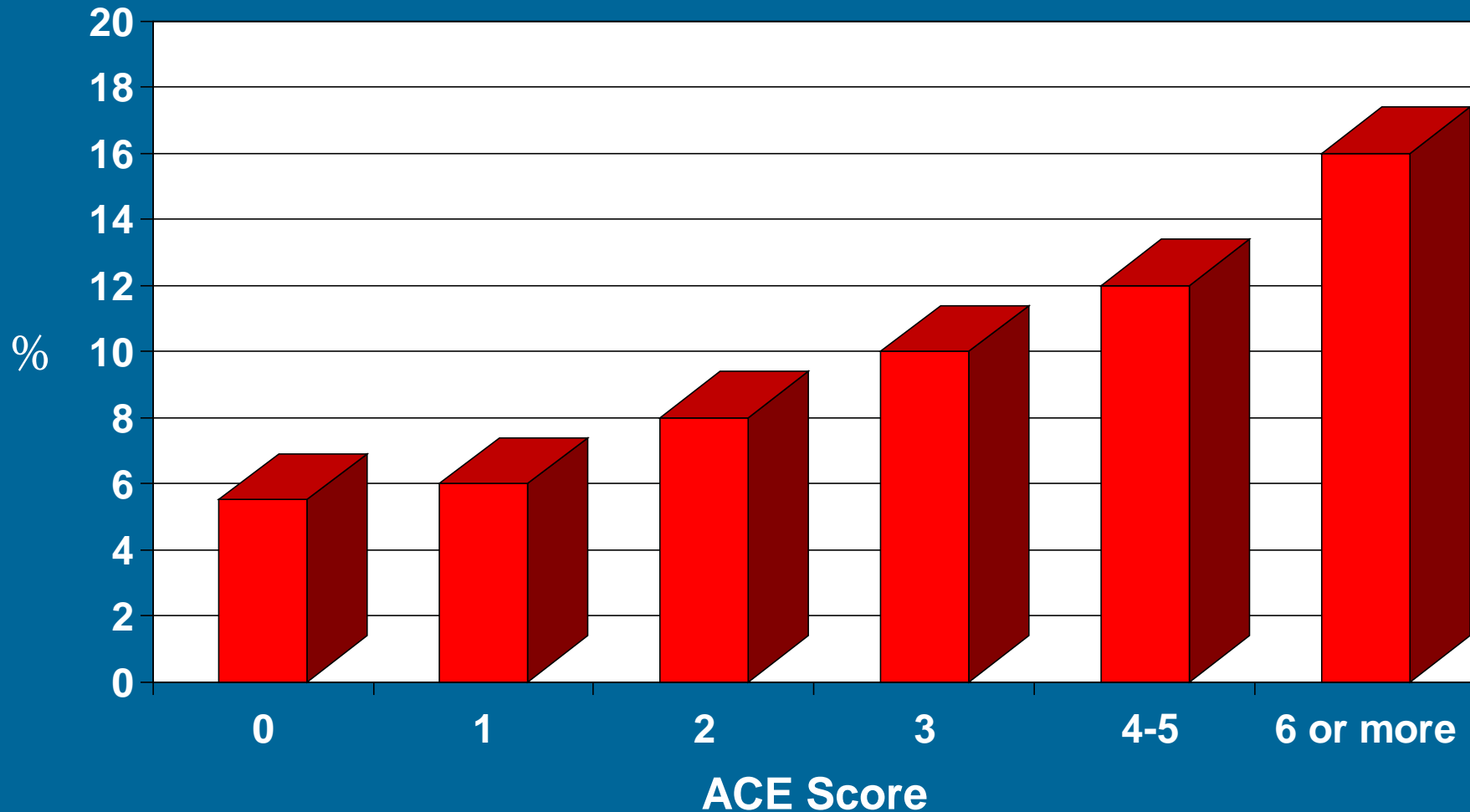
**Number of categories adverse childhood experiences are summed ...**

| <i>ACE score</i> | <i>Prevalence</i> |
|------------------|-------------------|
| 0                | 48%               |
| 1                | 25%               |
| 2                | 13%               |
| 3                | 7%                |
| 4 or more        | 7%                |



- More than *half have at least one ACE*
- If one ACE is present, the *ACE Score is likely to range from 2.4 to 4*

# Adverse Childhood Experiences vs. Current Smoking



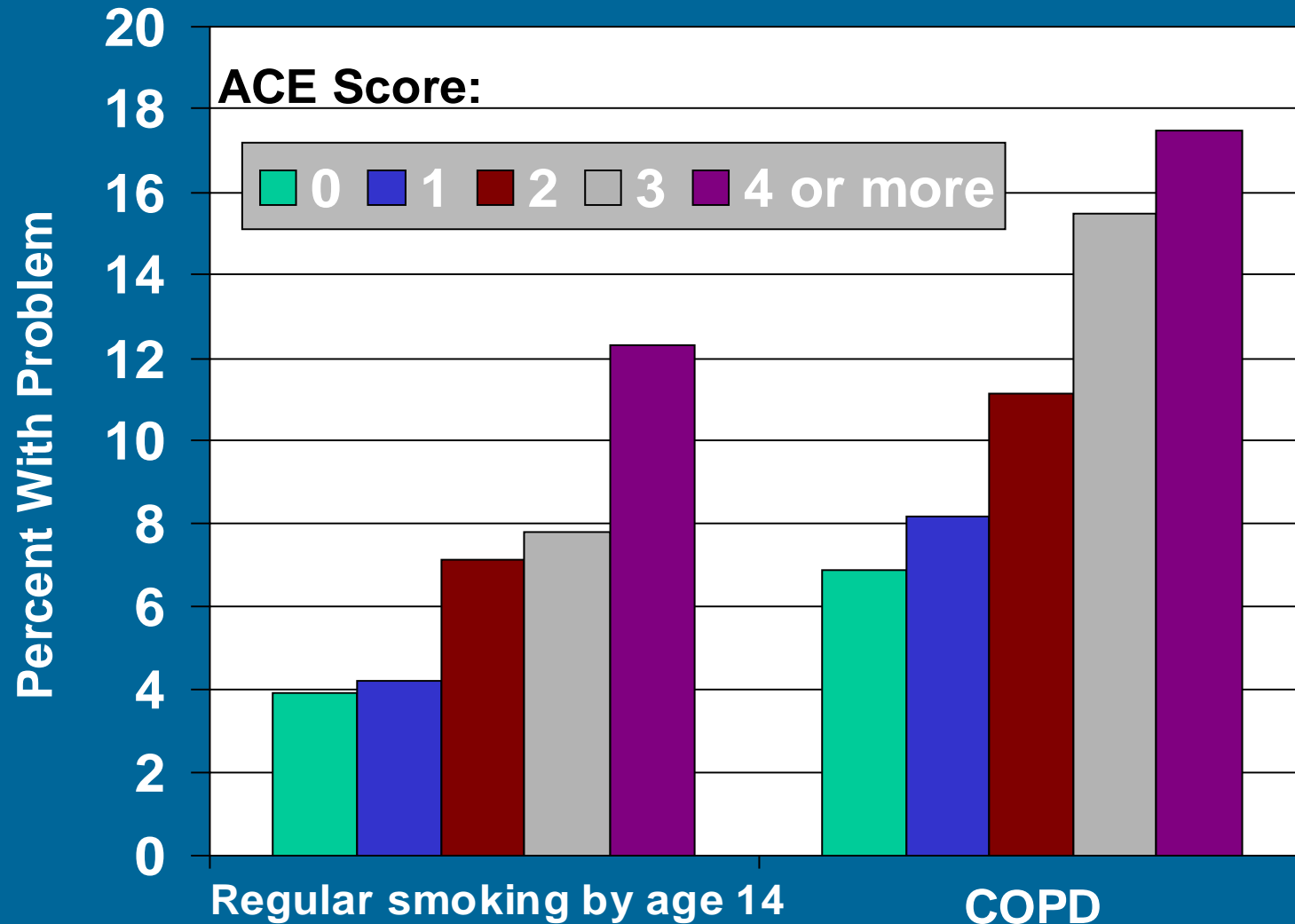


# Smoking to Self-Medicate



Smoke3-28comp

# ACE Score vs. Smoking and COPD

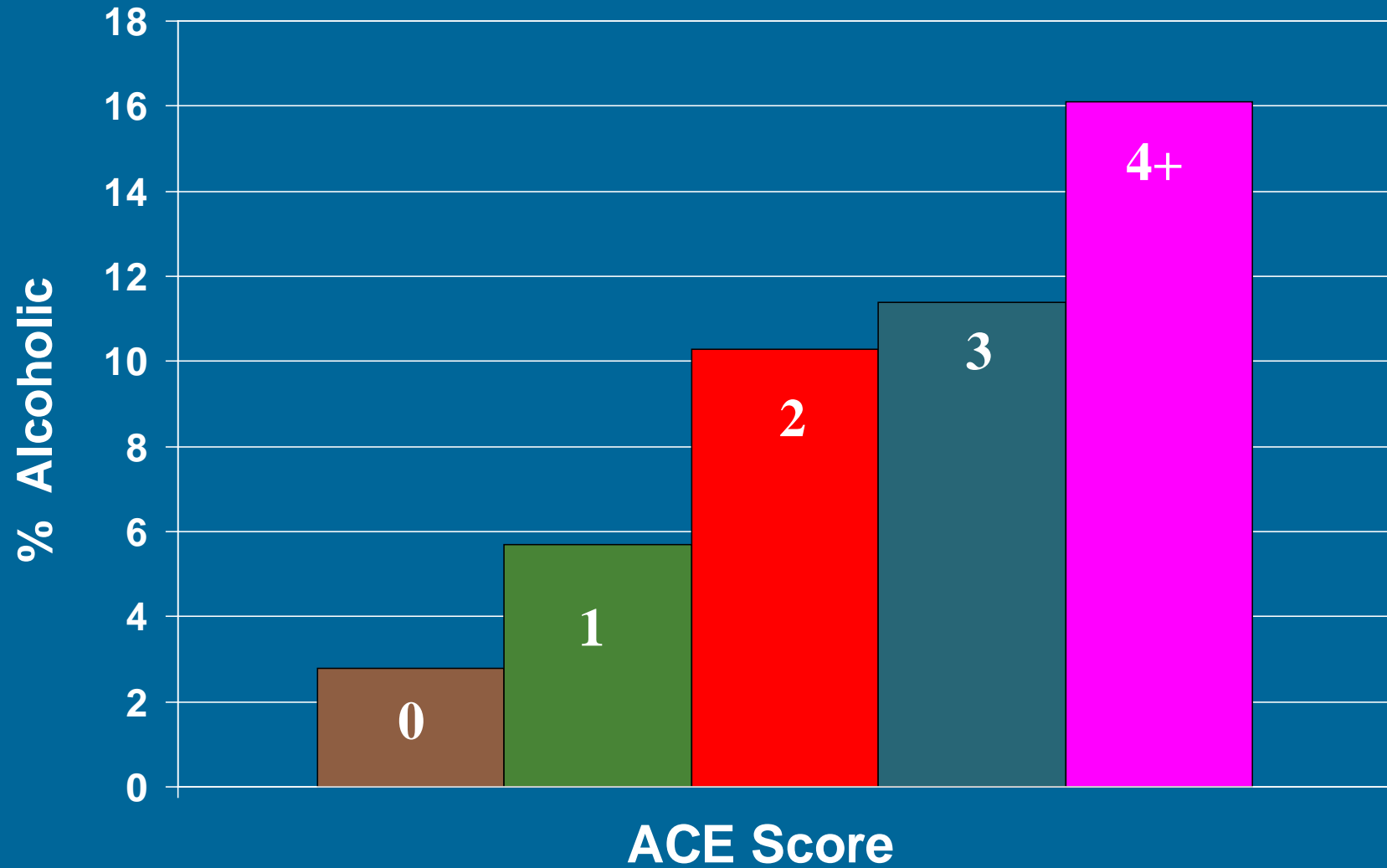


# Molestation in Childhood



Molest3-28comp

# Childhood Experiences vs. Adult Alcoholism



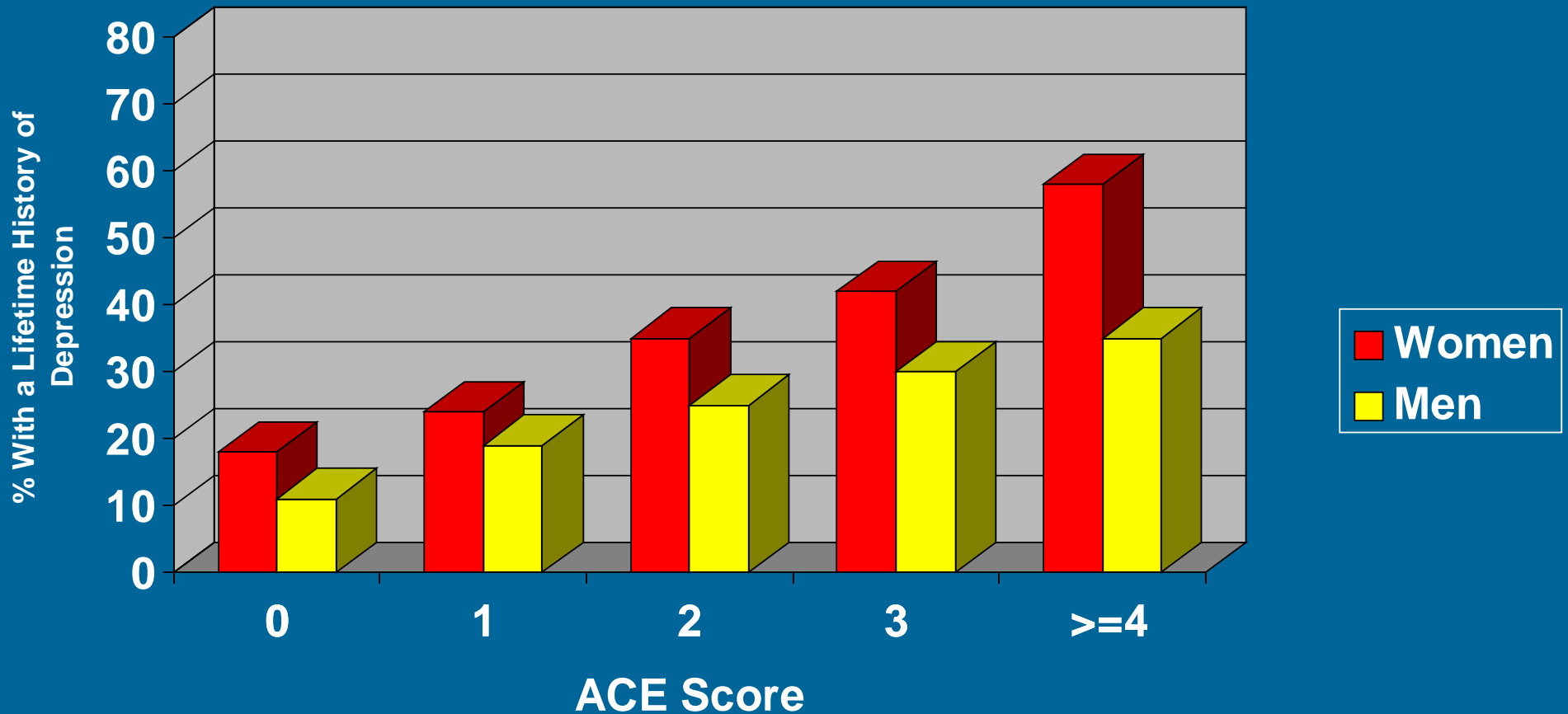
Some say depression is genetic.  
Some say depression is due to a chemical imbalance.



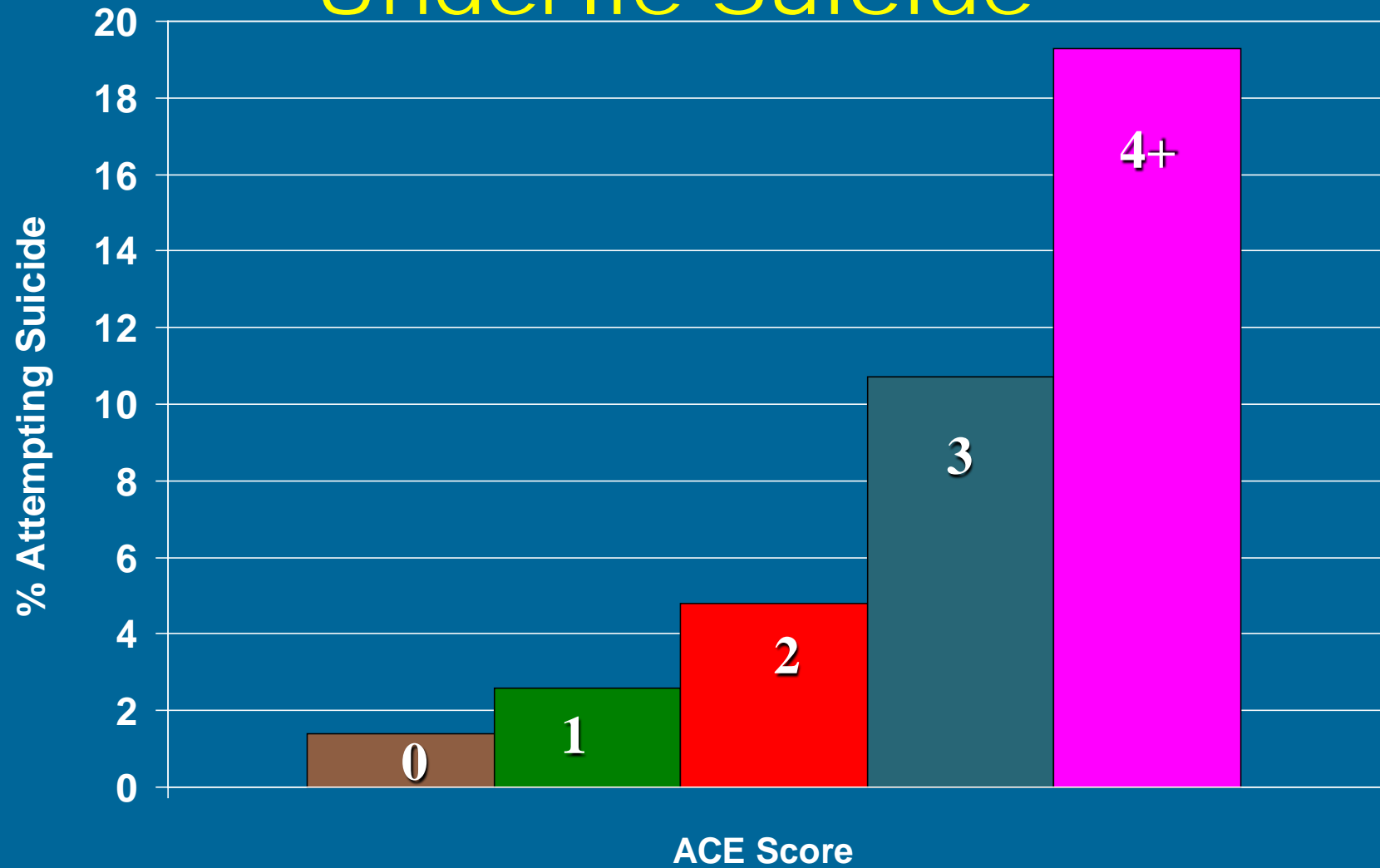
Might depression be a *normal* response to *abnormal life experiences*?



# Childhood Experiences Underlie Chronic Depression



# Childhood Experiences Underlie Suicide



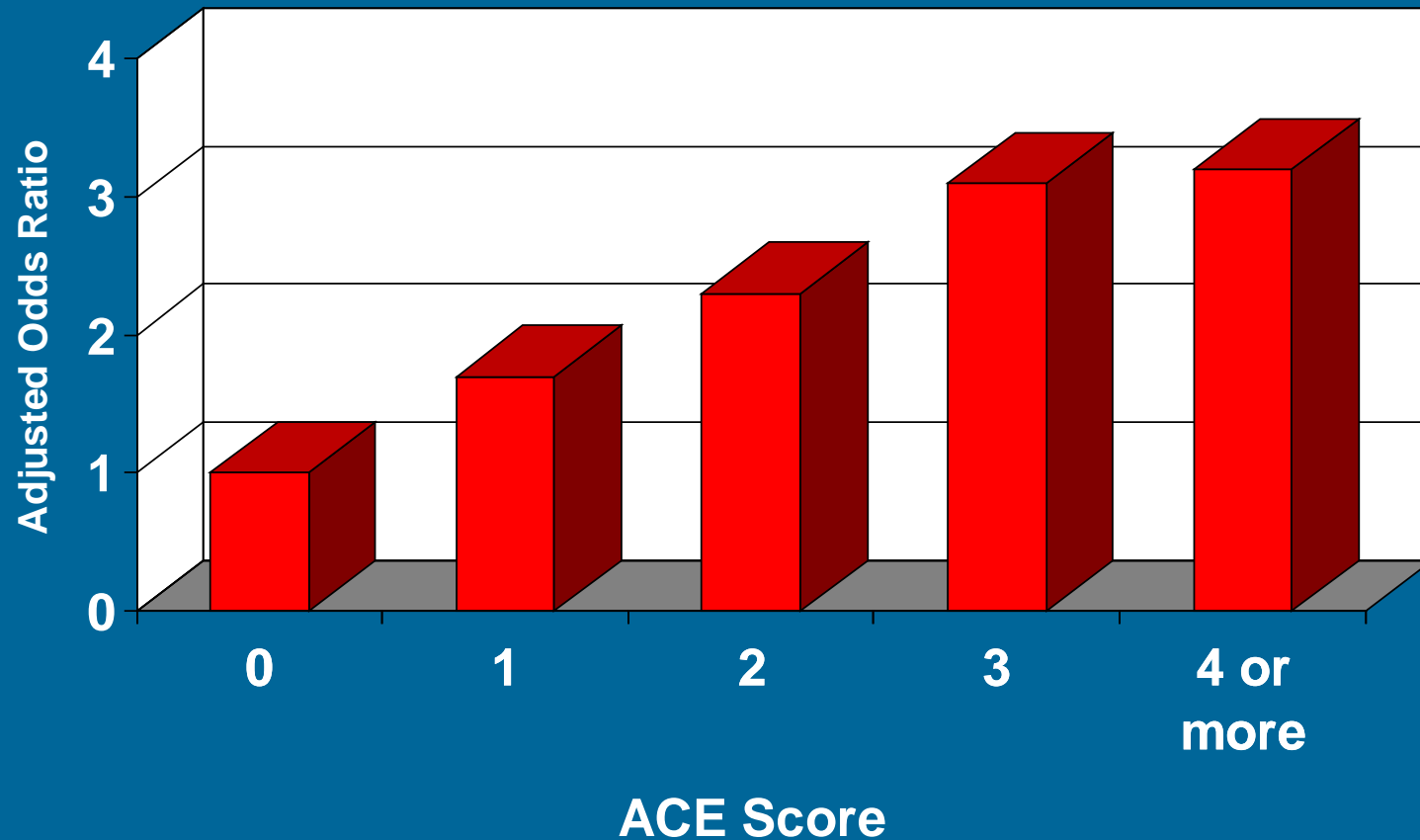


# Estimates of the Population Attributable Risk\* of ACEs for Selected Outcomes in Women

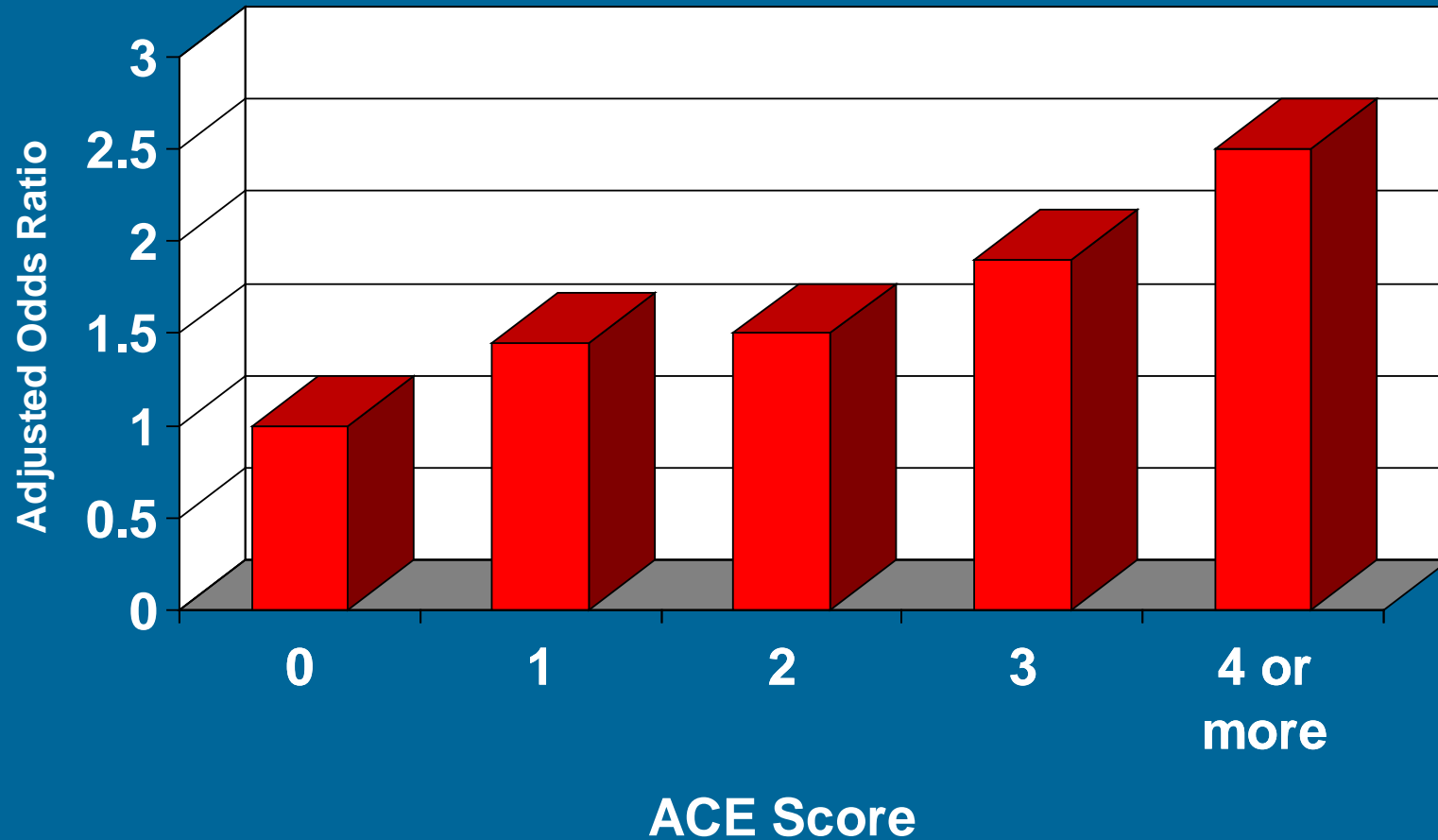
| Mental Health      | PAR |
|--------------------|-----|
| Current depression | 54% |
| Chronic depression | 41% |
| Suicide attempt    | 58% |

\*That portion of a condition attributable to specific risk factors

# Adverse Childhood Experiences vs. Likelihood of > 50 Sexual Partners



# Adverse Childhood Experiences vs. History of STD

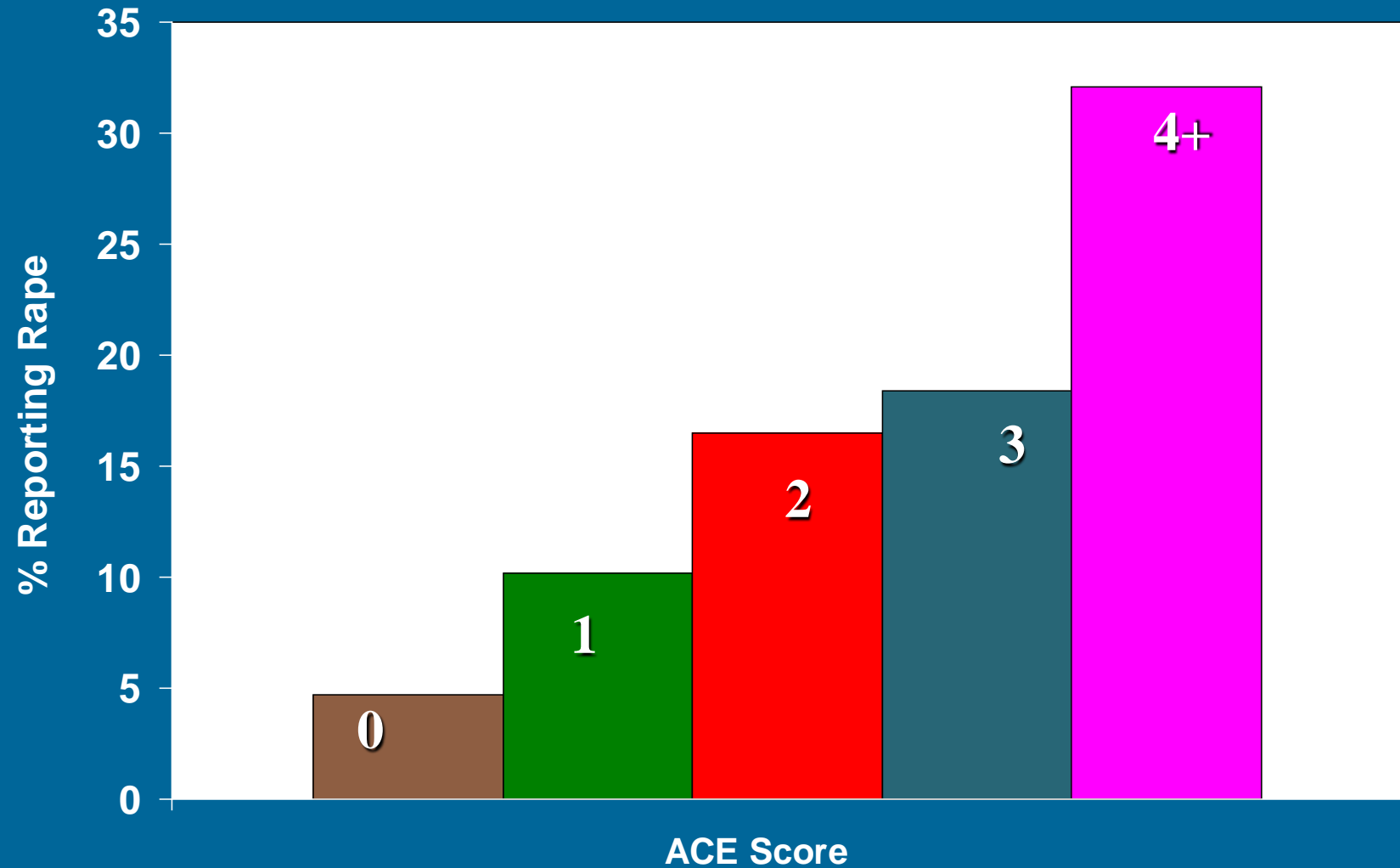


# Adverse Childhood Experiences and the Risk of:

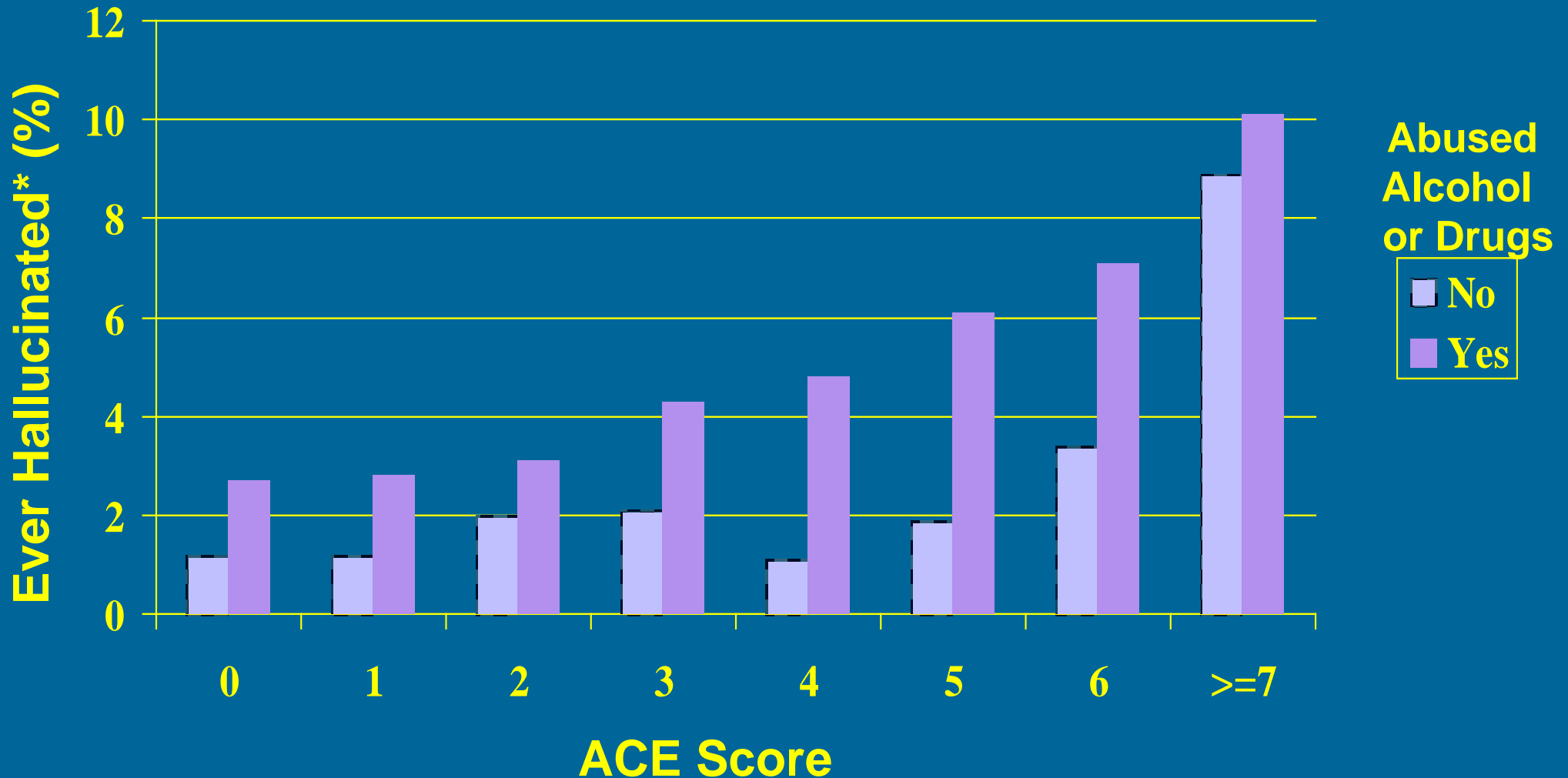
| <b>ACE Score</b> | <b>Multiple Sexual Partners*</b> | <b>3 or More Marriages*</b> | <b>Had Unwanted Pregnancy* (abortion)</b> |
|------------------|----------------------------------|-----------------------------|---|
| <b>0</b>         | <b>1.0</b>                       | <b>1.0</b>                  | <b>1.0</b>                                |
| <b>1</b>         | <b>1.6</b>                       | <b>1.5</b>                  | <b>1.5</b>                                |
| <b>2</b>         | <b>1.9</b>                       | <b>1.6</b>                  | <b>1.7</b>                                |
| <b>3</b>         | <b>3.4</b>                       | <b>2.3</b>                  | <b>2.3</b>                                |
| <b>4</b>         | <b>4.4</b>                       | <b>2.9</b>                  | <b>2.1</b>                                |
| <b>≥5</b>        | <b>5.8</b>                       | <b>3.8</b>                  | <b>2.9</b>                                |

**\*Adjusted Odds Ratio**

# Childhood Experiences Underlie Rape



# ACE Score and Hallucinations



\*Adjusted for age, sex, race, and education.

# Adverse Childhood Experiences and the Risk of:

| <b>ACE Score</b> | <b>Intimate Partner<br/>Violence*</b> | <b>Being Raped*</b> |
|------------------|---------------------------------------|---------------------|
| <b>0</b>         | <b>1.0</b>                            | <b>1.0</b>          |
| <b>1</b>         | <b>1.9</b>                            | <b>2.0</b>          |
| <b>2</b>         | <b>2.1</b>                            | <b>2.8</b>          |
| <b>3</b>         | <b>2.7</b>                            | <b>4.2</b>          |
| <b>4</b>         | <b>4.5</b>                            | <b>5.3</b>          |
| <b>≥5</b>        | <b>5.1</b>                            | <b>8.9</b>          |

**\*Adjusted Odds Ratio**

# Estimates of the Population Attributable Risk\* of ACEs for Selected Outcomes in Women

|                        | PAR |
|------------------------|-----|
| Depression and Suicide | 48% |
| Crime Victim           |     |
| Sexual Assault         | 62% |
| Domestic Violence      | 52% |

\*That portion of a condition attributable to specific risk factors



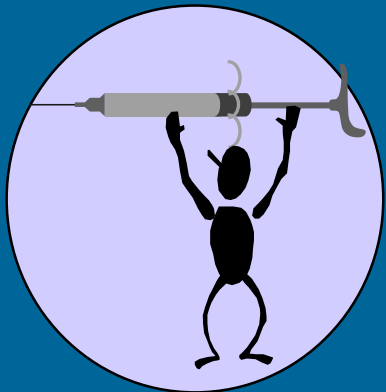
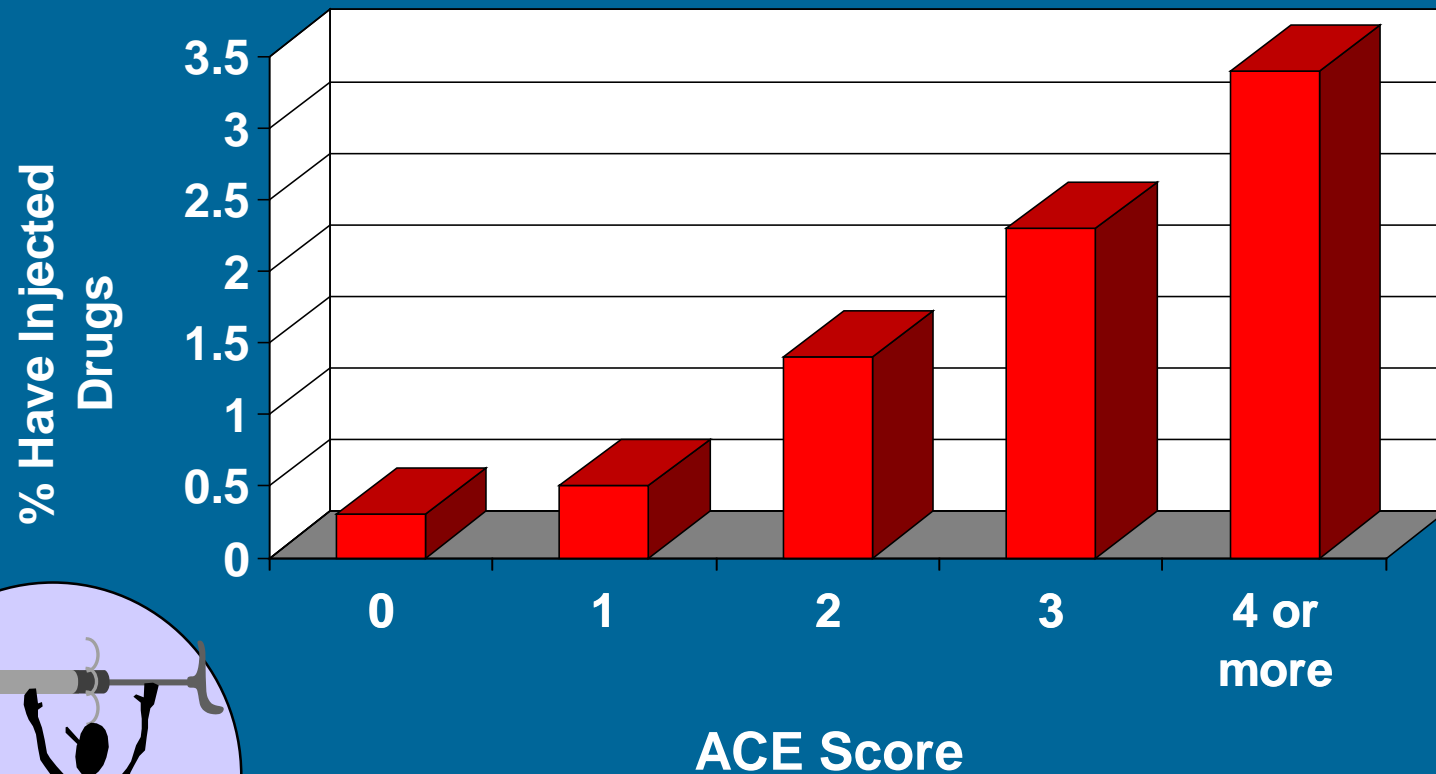
**The traditional concept:**

“Addiction is due to the characteristics intrinsic in the molecular structure of some substance.”

**We find that:**

“Addiction highly correlates with characteristics intrinsic to that individual’s childhood experiences.”

# ACE Score vs. Intravenous Drug Use



**N = 8,022**    **p < 0.001**

# Adverse Childhood Experiences and the Risk of:

| <b>ACE Score</b> | <b>Alcoholism*</b> | <b>Parenteral<br/>Drug Abuse*</b> | <b>Attempted<br/>Suicide*</b> |
|------------------|--------------------|-----------------------------------|-------------------------------|
| <b>0</b>         | <b>1.0</b>         | <b>1.0</b>                        | <b>1.0</b>                    |
| <b>1</b>         | <b>1.9</b>         | <b>1.0</b>                        | <b>1.8</b>                    |
| <b>2</b>         | <b>2.1</b>         | <b>2.5</b>                        | <b>4.0</b>                    |
| <b>3</b>         | <b>2.7</b>         | <b>3.5</b>                        | <b>4.0</b>                    |
| <b>4</b>         | <b>4.5</b>         | <b>3.8</b>                        | <b>7.2</b>                    |
| <b>≥5</b>        | <b>5.1</b>         | <b>9.2</b>                        | <b>16.8</b>                   |

**\*Adjusted Odds Ratio**

# Estimates of the Population Attributable Risk\* of ACEs for Selected Outcomes in Women

| <u>Drug Abuse</u> | <u>PAR</u> |
|-------------------|------------|
| Alcoholism        | 65%        |
| Drug abuse        | 50%        |
| IV drug use       | 78%        |

\*That portion of a condition attributable to specific risk factors

Adverse Childhood Experiences  
determine the likelihood of the  
ten most common causes of  
death in the United States.

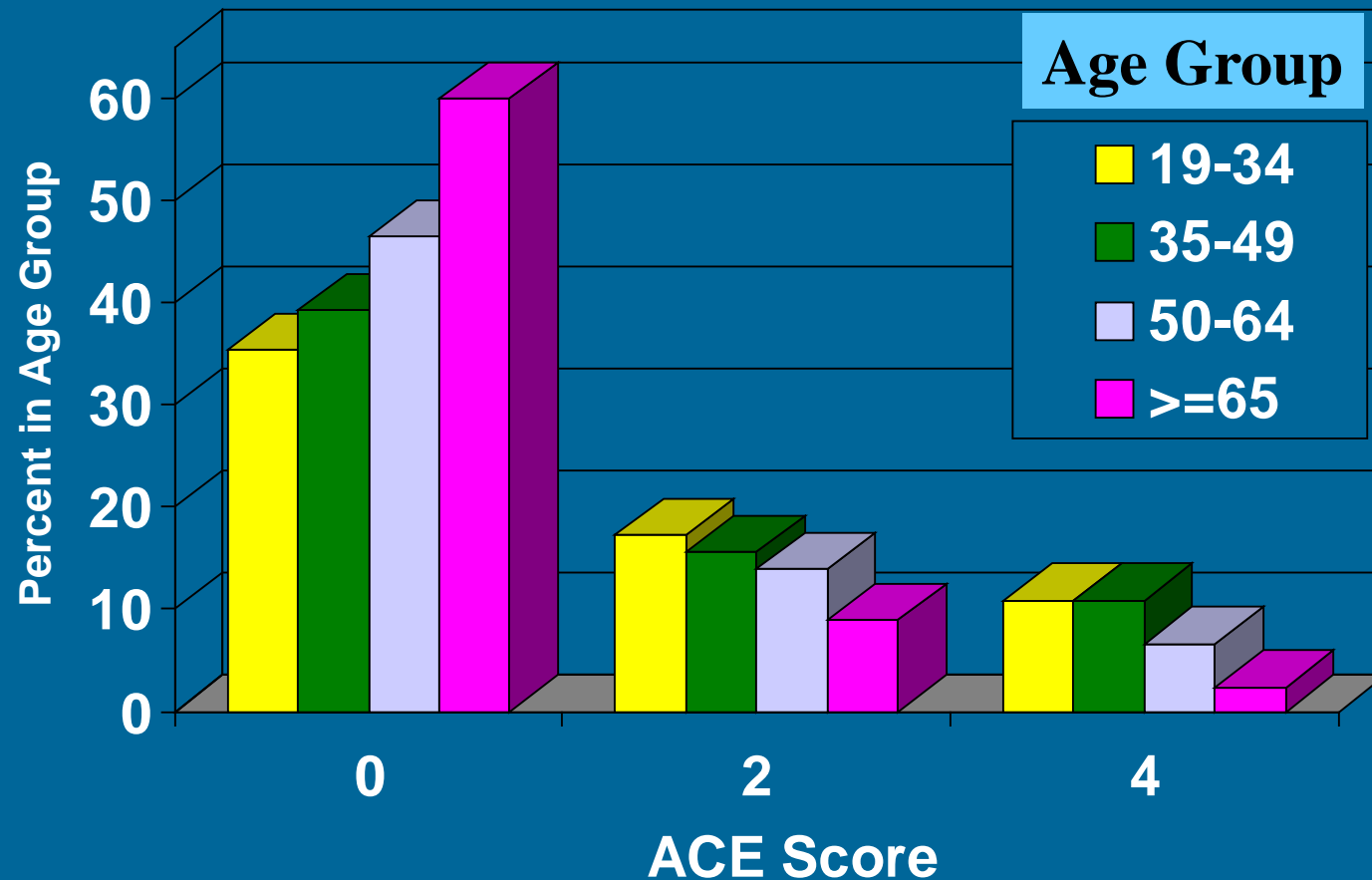
**Top 10 Risk Factors:** smoking, severe obesity, physical inactivity,  
depression, suicide attempt, alcoholism, illicit drug use, injected drug use,  
50+ sexual partners, h/o STD.

With an ACE Score of 0, the majority of adults have few, if any, risk factors for these diseases.

However, with an ACE Score of 4 or more, the majority of adults have multiple risk factors for these diseases or the diseases themselves.



# Effect of ACEs on Mortality



Many chronic diseases  
in adults are determined  
decades earlier, in  
childhood.

Their risk factors are also  
reliable markers for  
antecedent problems.

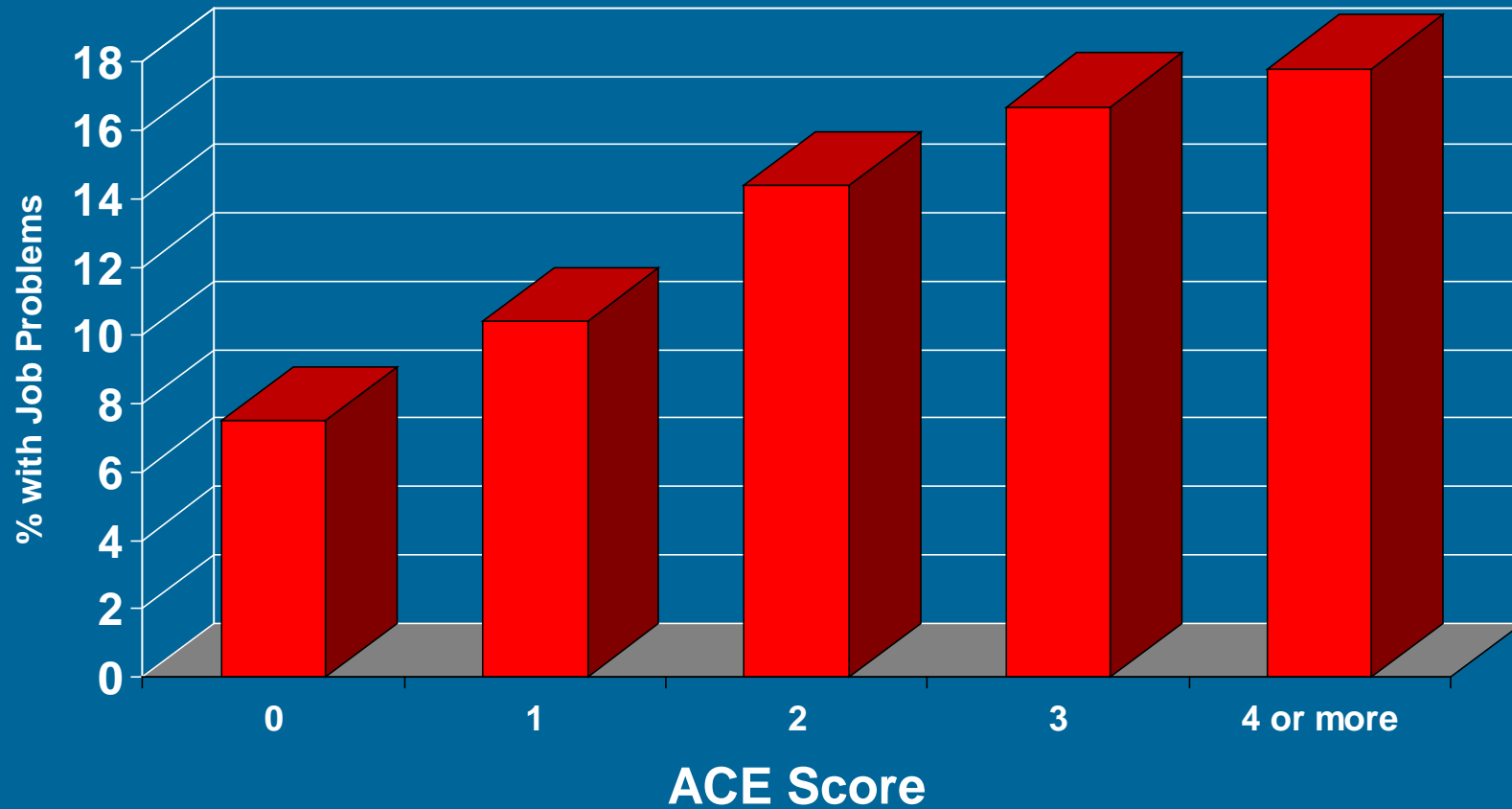
*“In my end is my beginning.”*

T.S. Eliot - Quartets

Dismissing them as “bad habits” or “self-destructive behavior” totally misses their function.



# ACE Score vs. Serious Job Problems



Much of what causes time to  
be lost from work is actually  
predetermined decades  
earlier  
by the adverse experiences  
of childhood.

**Premature mortality and excess morbidity are typically the result of a small number of common diseases.**



ACE = Parental Loss

Evidence from ACE Study Suggests:  
These chronic diseases in  
adults are determined  
decades earlier, by the  
experiences of childhood.



Affective Response



Evidence from ACE Study Suggests:



Risk factors for these diseases are initiated during childhood or adolescence . . .

Seeking to Cope

Evidence from ACE Study Suggests:



. . . and continue  
into adult life.

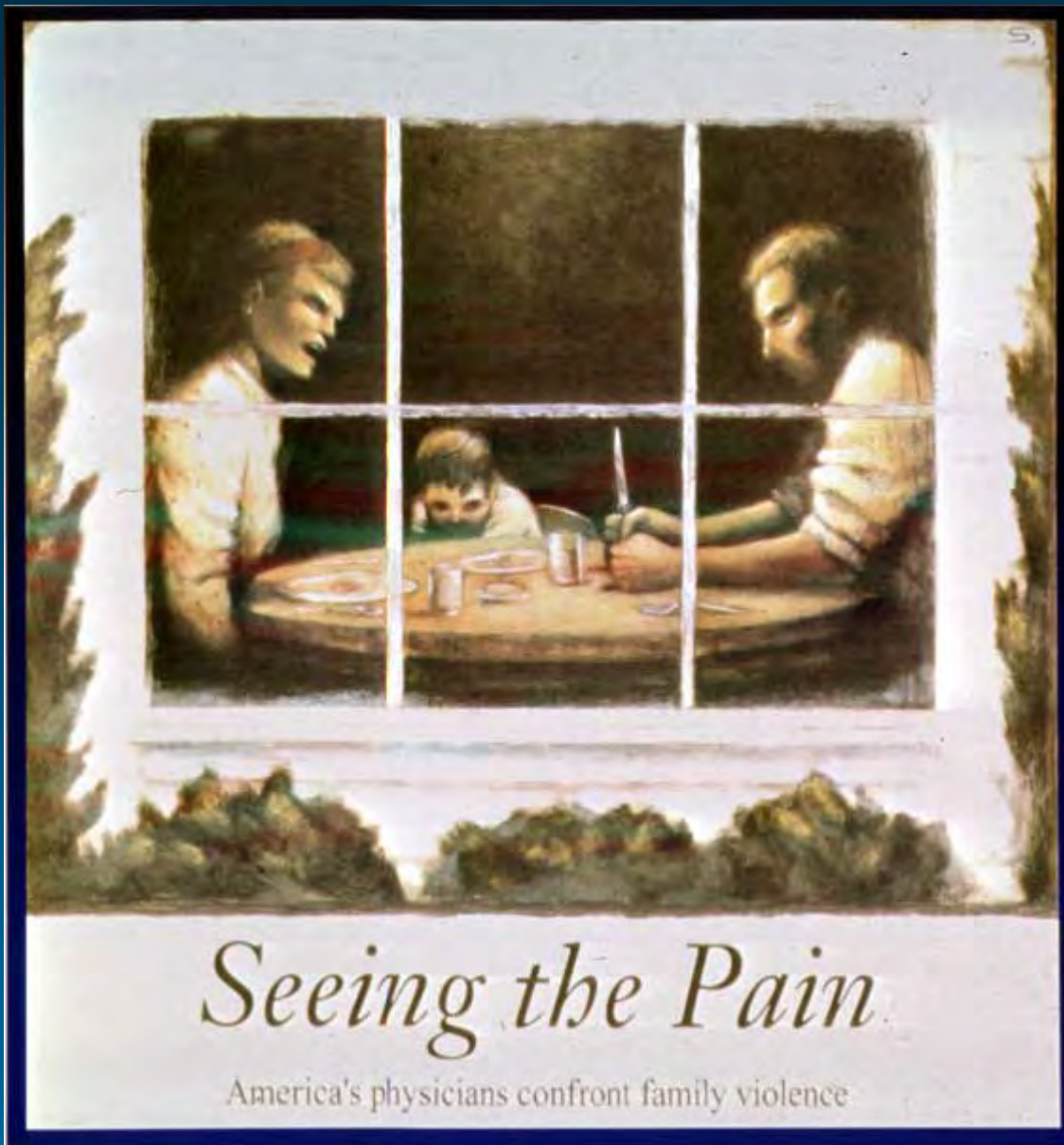
Outcome: social and biomedical damage



Another possible outcome.

The risk factors underlying these adult diseases are effective coping devices.



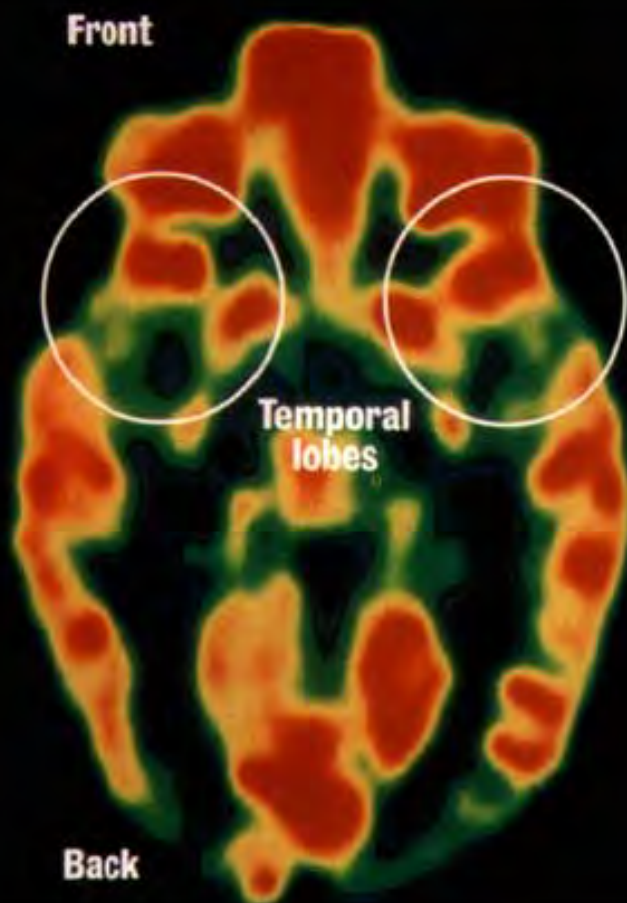


**Why is this so difficult to treat later?**

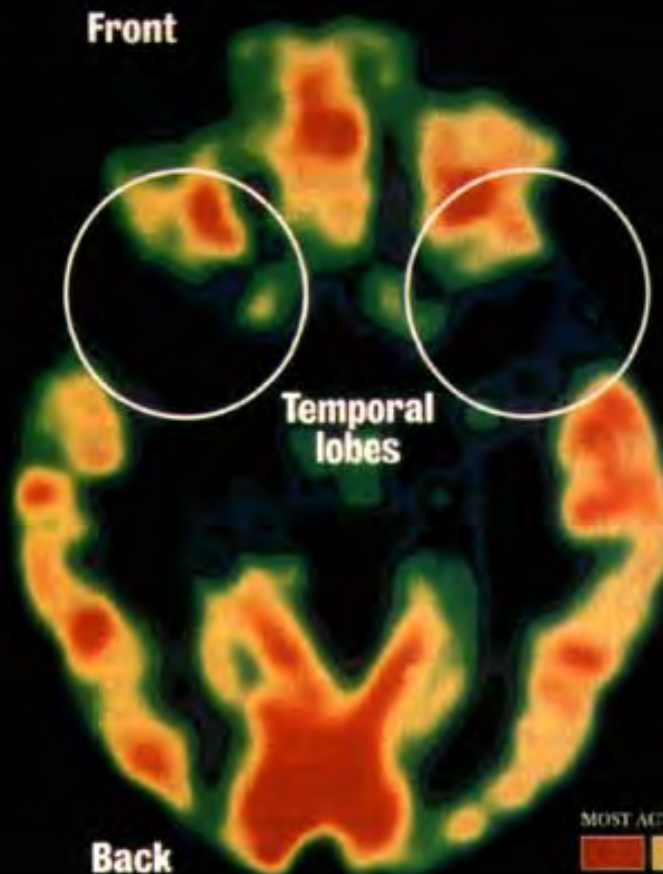


## Healthy Brain

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.



Front



## An Abused Brain

This PET scan of the brain of a Romanian orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.

MOST ACTIVE      LEAST ACTIVE

The legend consists of five colored squares arranged horizontally: red, orange, green, blue, and black. The red square is labeled 'MOST ACTIVE' and the black square is labeled 'LEAST ACTIVE'.

What is conventionally  
viewed as a problem  
is actually a solution to  
an unrecognized prior  
adversity.

## **Evidence from ACE Study Suggests:**

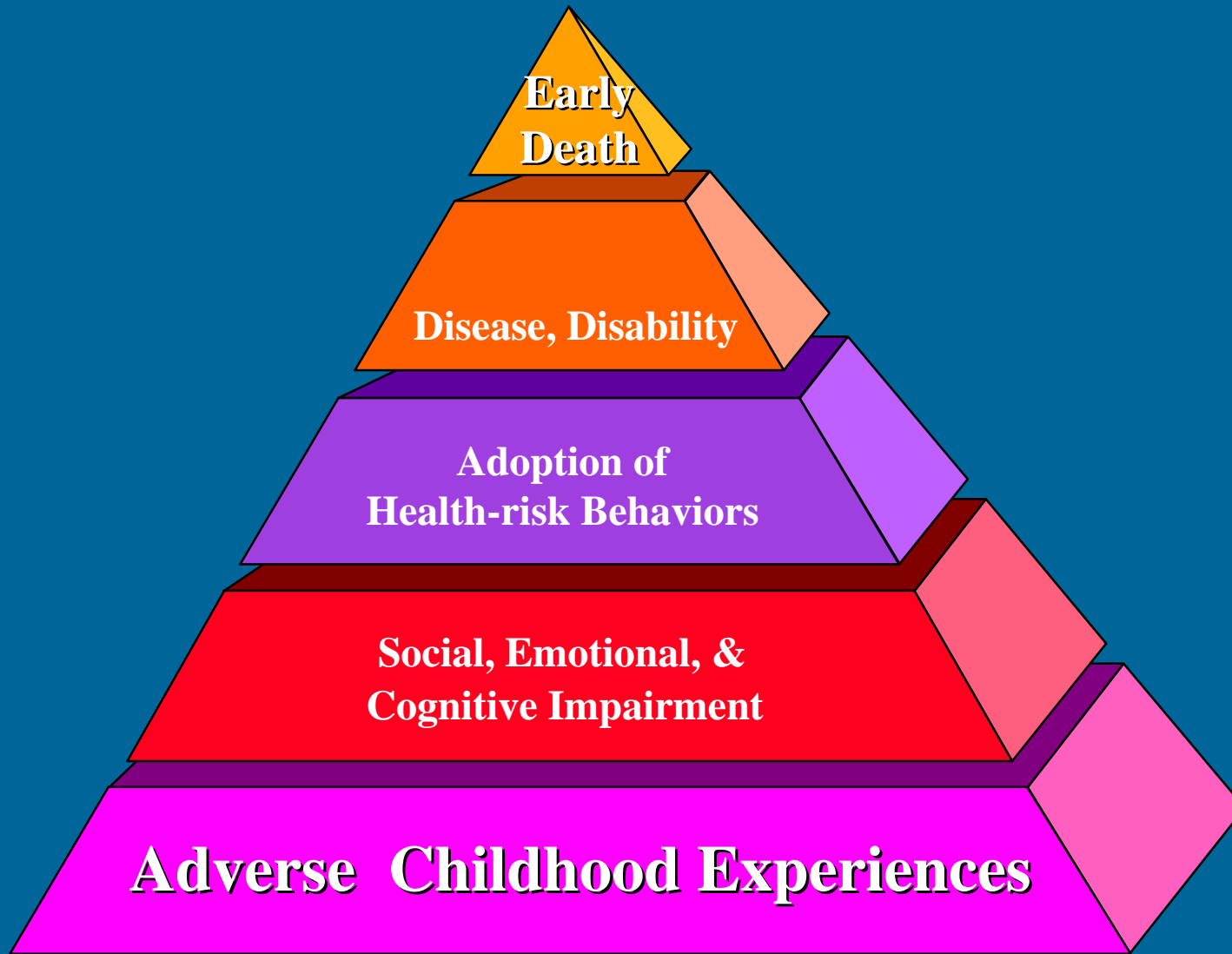
Adverse childhood experiences are the most basic cause of health risk behaviors, morbidity, disability, mortality, and healthcare costs.



**Death**



**Birth**



The Influence of Adverse  
Childhood Experiences Throughout Life

*“The truth about childhood is stored up in our bodies and lives in the depths of our souls. Our intellect can be deceived, our feelings can be numbed and manipulated, our perceptions shamed and confused, our bodies tricked with medication, but our soul never forgets. And because we are one, one whole soul in one body, someday our body will present its bill.”*

**Alice Miller**

# Bridging the Chasm



**Child  
health  
and  
well-being  
as it  
stands  
today.**

**Acknowledgment that  
the problem exists.**

**Recognition of cases  
in medical practice.**

**Child  
health  
and  
well-being  
as it  
could be.**

# What Can We Do Now?

- Routinely seek history of adverse childhood experiences from *all* patients
- Acknowledge their reality by asking, “*How has this affected you later in life?*”
- Arrange a return appointment to discuss possibilities for helping them.