The Magnitude of the Solution

Risk, Co-Occurring Problems, Public Costs

High Leverage Solutions
Experience & Adaptation

Dangerous

Conception

BRAIN Prepares for anticipated world

TOXIC STRESS

CHARACTERISTICS
“Brawn over Brains”
Focused: Fight, Flight or Freeze

OUTCOME
Individual & species survive the worst conditions

Dissonance between biological expectations & social reality fuels problems

Safe

BRAIN

CHARACTERISTICS
“Process over Power”
Multi-focused: Relational

OUTCOME
Individual & species survive in good times; vulnerable in poor conditions

Adapted from the research of Martin Teicher, MD, Ph.D.
Each Person: A Unique Experience of the World
Neuroscience: Individuals

Epidemiology: Population

The ACE Study
Dr. John Snow
1854

Cholera Death is Caused by Miasmas

1. New Way of Thinking
2. Shoe Leather Epidemiology
3. Lives Saved
Adverse Childhood Experiences Study

Largest Study of its Kind

Over 17,000 participants

Both Retrospective and Prospective

Over 100 Peer-Reviewed Journal Articles

Shifting the Paradigm

Helps Us Understand Drivers of Population Health and Wellbeing
### Adverse Childhood Experiences (ACEs) Are Common

#### Household Dysfunction
- Substance Abuse: 27%
- Parental Sep/Divorce: 23%
- Mental Illness: 17%
- Battered Mothers: 13%
- Criminal Behavior: 6%

#### Neglect
- Emotional: 15%
- Physical: 10%

#### Abuse
- Emotional: 11%
- Physical: 28%
- Sexual: 21%

**Total ACEs: 10**

**ACEs Are Interrelated**
ACE Scores Reliably Predict Population-Level Challenges Throughout the Life Course

Percentage of ACE scores in Oregon

Number of Adverse Childhood Experiences

Source: "Building Resiliency: Preventing Adverse Childhood Experiences (ACEs)," Oregon Health Authority.
A CLASSIC CAUSAL RELATIONSHIP
MORE ACEs = MORE HEALTH PROBLEMS

Dose-response is a direct measure of cause & effect.

The “response”—in this case the occurrence of the health condition—is caused directly by the size of the “dose”—in this case, the number of ACEs.
A Significant Portion Of Risk for Disease Is Attributable to ACEs...

- Smoking
- Heavy Drinking
- Binge Drinking
- Drinking and Driving
- Had a Drug Problem
- Addicted to Drugs
- Ever Injected Drugs
A Significant Portion of Chronic Disease is Attributable to ACEs

Cardio Vascular Disease
Cancer
Diabetes
Asthma
Auto Immune Disease
Chronic obstructive pulmonary disease
Ischemic heart disease
Liver Disease
A Large Portion of Mental Illness Is Attributable to ACEs...

Depression
Serious & persistent mental illness
Frequent mental distress
Nervousness
Suicide attempts
Emotional problems restrict activities
Outcomes Attributable to ACEs

**Risk**
- Smoking
- Heavy drinking
- Obesity
- Risk of AIDS
- Taking painkillers to get high
- Obesity

**Prevalent Disease**
- Cardiovascular
- Cancer
- Asthma
- Diabetes
- Auto immune
- COPD
- Ischemic heart disease
- Liver disease

**Poor Mental Health**
- Frequent mental distress
- Sleep disturbances
- Nervousness
- MH problem requiring medication
- Emotional problems restrict activities
- Serious & persistent mental illness

**Health & Social Problems**
- Fair or poor health
- Life dissatisfaction
- Health-related limits to quality of life
- Disability that impedes daily functioning
- Don’t complete secondary education
- Unemployment
- History of adult homelessness

**Intergenerational ACE Transmission**
- Mental Illness
- Drugs or Alcohol Problem
- Multiple divorces, separations
- Victim of family violence
- Adult incarceration
ACEs and High School Youth

Population
Average-10th Grade

42% ≥ 3 ACEs
10% ≥ 6 ACEs
Pathways – Progressive Nature of Adversity

**EARLY TRAUMA & STRESS**

- Predictable patterns of brain development, traits & behaviors
- Slowed language & reading
- Lateralization
- Diminished IQ
- Poor decision making skills
- Memory Problems
- Attention problems
- ADD
- ADHD
- Aggressive behavior
- Social isolation among peers
- Poor understanding of social cues = conflict

**ADULT STRESS**

- Low-wage jobs
- Unemployment
- Public Assistance
- Prison
- Chronic health problems
- Debilitating mental health

**NEXT GEN RISK**

- Special education
- School failure
- Dropping out
- Suspension
- Expulsion
- Delinquency
- Dropping out

**Significant risk of early use/abuse of:**
- Alcohol
- Tobacco
- Illicit & prescription drugs
- Conflict
ACE Score and Indicators of Impaired Worker Performance

Original ACE Study
Work-Related Injury or Illness in Past Year

<table>
<thead>
<tr>
<th>% with Injury/Illness</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4, 5</th>
<th>6, 7, 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>3.6</td>
<td>5</td>
<td>7</td>
<td>6.1</td>
<td>8.9</td>
<td>10.1</td>
</tr>
</tbody>
</table>
ACEs and Unemployment

Cascade of Experience - Societal Response Matters

Historic Trauma

Adverse Childhood Experience

Adverse Peer &/or School Experience

Adverse Adult Experience

Multiple Mental, Physical, Relational, &/or Productivity Problems

ACE Transmission Risk
ACEs & History of Homelessness

25-54 yr Old Adult Population

- 0 ACEs: 2.20%
- 1 ACE: 2.20%
- 2 ACEs: 5.50%
- 3 ACEs: 11.10%
- 4-5 ACEs: 18.90%
- 6-8 ACEs: 29.80%

2010 BRFSS – Preliminary; Based on < Full Year of Data
ACEs and Co-Occurring Problems

- Health & Social Problems
  - Panic Reactions
  - Depression
  - Anxiety
  - Hallucinations
  - Sleep Disturbances
  - Severe Obesity
  - Pain
  - Smoking
  - Alcoholism
  - Illicit Drug Use
  - IV Drug Use
  - Early Intercourse
  - Promiscuity
  - Sexual Dissatisfaction
  - Amnesia (Childhood)
  - Problems with Anger
  - Perpetration of Family Violence

- Affect Regulation
- Somatic Issues
- Substance Use
- Sexuality
- Memory
- Arousal
Adult Adversity Compounds Effects

Adults with ≥3 ACEs
  Plus
  Major Stress Categories:
  1. Homelessness
  2. Incarceration
  3. Chronic illness
  4. Separation/Divorce
  5. Severe Depression
  6. Work-related Injury/ Illness

Number of Major Stress Categories In Adulthood
Added to ACE Score of ≥3

% with 15-30 Disability-Interrupted Days a Month

0 1 2 3

ACE Interface
Progressive Nature of Adversity
Population Perspective

Elementary Children
12% ≥ 3 ACEs
1. Health, attendance, behavior
2. Academic failure

High School Youth
42% ≥ 3 ACEs

Court-Involved Youth
Higher ACE Scores
Among those with ≥4:
51% special ed.
(vs. 33% 0-1)
74% below 2.0 GPA (58%)
85% suspended by 2nd (71%)
33% re-offend in 2 years (13%)

Adult Adversity
1. Incarceration
2. Victim: Intimate Partner Violence
3. Drug/Alcohol
4. Mental Illness
5. Divorce
Work injury- illness
Homelessness
Disability
Poverty
Health limits activity
Unemployment

Parenting Adults
with ≥5 ACE
14 TIMES more likely to have two or more conditions that make ACEs for kids

Progressive Nature of Adversity
Economic Toll

- Child maltreatment: $210,012 (per person among those who live)
- Stroke: $159,846 (per person)
- Type 2 diabetes: between $181,000 and $253,000 (per person)

Per Year in US

- Anxiety disorders: $42.3 billion per year in the US in the 1990s (majority due to non-psychiatric medical treatment costs; costs estimated did not include increased risk of other disorders)
- All Mental Illness: $300 billion estimated in US in 2002
- Coronary heart disease: $108.9 billion each year in the US
- Child Maltreatment: 124 billion – total lifetime estimated financial costs associated with one year of confirmed cases of child maltreatment (productivity, health care, special ed., child welfare, criminal justice)
Cost Centers

Workforce
Health
Corrections
Housing & Shelter
Behavioral Health
Child Welfare
Economic Asst.

1. Awareness & Professional Development
2. Authorization for ACE-informed innovation
3. Trauma-Sensitive Service Environment
4. Customer Education – scripts, reflective supervision; people have a right to know the most powerful determinant of health
5. Accommodations including changes in sanctions/discipline/instruction/place
6. Extend services to include peer models (e.g.: Community Health Workers) and community capacity building
Prevention Across the Life Course

- Pathways
- Trajectories
- Critical & Sensitive Periods
- Cumulative Impacts
- History & Context
- Complex Interplay of Biological & Social Factors
ACEs Are Not Destiny

People affected by ACEs are becoming the leaders of Healthy Communities...

promoting sustained, steady, strong, “growing well” throughout the life course; creating conditions that support the sacredness of being human together.
High Leverage: Dual Generation Approach

Moderate ACE Effects - Improve Wellbeing Among Parenting Adults

Prevent High ACE Scores among Children

Mutually Reinforcing
How Might Parenting Be More Difficult?

Health
- Chronic disease
- Mental health disorders – Especially Depression
- Suicide
- Dissociative disorder
- Borderline personality disorder
- Brain matter loss

Cognition
- Slowed language development
- Attention problems
- Speech delay
- Poor verbal memory/recall
- Brain matter loss
- IQ

Behavior
- Alcohol, Tobacco, Drug Use/Addiction
- Aggression & violent outbursts
- Physical agility problems
- Risk taking
- Productivity

Relationships
- Can’t modify behavior/
  Respond to social cues
- Poor self-control of emotion
- Social isolation
- Can’t navigate friendships
- Difficulty with monogamy

Crisis
- Homeless
- Unemployed
- Injured on Job
- Victimized
- Incarceration
- Divorced
Core Protective Systems

“Nurturing the healthy development of these protective systems affords the most important preparation or ‘inoculation’ for overcoming potential threats and adversities in human development. Similarly, damage or destruction of these systems has dire consequences for the positive adaptive capacity of individuals.”

Ann Masten, 2009
Social/Emotional Support - Resilience Factor

- Cardiovascular
  - Rarely/Never: 7.50%
  - Sometimes: 7.00%
  - Always/Usually Have Support: 5.70%

- Diabetes
  - Rarely/Never: 10.40%
  - Sometimes: 9.10%
  - Always/Usually Have Support: 7.20%

- Receive Treatment for Mental Illness
  - Rarely/Never: 15.70%
  - Sometimes: 8.20%
  - Always/Usually Have Support: 1.40%
Poor Mental Health Days
& Experiencing Help & Hope

% Days w/Poor MH

<table>
<thead>
<tr>
<th>ACE Level</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ACE</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>1-3 ACEs</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>4-8 ACEs</td>
<td>15</td>
<td>45</td>
</tr>
</tbody>
</table>
Poor Physical Health Days & Experiencing Help & Hope

% Days w/Poor PH

0 ACE
1-3 ACEs
4-8 ACEs

High
Low

ACE Interface
Community Capacity Development

General Community Capacity is: capacity to not only sustain programs, but also to identify new community problems as they arise, and develop ways of addressing them.

Literature strongly supports the importance of general capacity building in the process of promoting effective prevention. (Livet, 2008)
THE POWER OF COMMUNITY CAPACITY
LESS DEPRESSION & SERIOUS PERSISTENT MENTAL ILLNESS

Ages 18 – 34 with 3-8 ACEs

Significant differences after controlling for age, education, income, race/ethnicity, and ACE score.
The Power of Community Capacity
Better Outcomes among 18-34 Year Olds

% with Post High School Education

- No Networks Using FPC Model: 43%
- Forming, Using FPC Model: 54%
- Shifting and Persisting: 52%
- Thriving (High Capacity Scores Over 6 Biennia): 63%

% Employed

- No Networks Using FPC Model: 87%
- Forming, Using FPC Model: 89%
- Shifting and Persisting: 91%
- Thriving (High Capacity Scores Over 6 Biennia): 94%
Lower ACE Scores in High Capacity Communities

Source: Strength, Stress, Work, Hope; Technical Appendix, in press; Washington Family Policy Council; 2012

Percent with ≥3 ACEs

<table>
<thead>
<tr>
<th>Networking Status</th>
<th>% with 3+ ACEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Networks Using FPC Model</td>
<td>38%</td>
</tr>
<tr>
<td>Forming, Using FPC Model</td>
<td>36%</td>
</tr>
<tr>
<td>Shifting and Persisting</td>
<td>34%</td>
</tr>
<tr>
<td>Thriving (High Capacity Scores Over 6 Biennia)</td>
<td>29%</td>
</tr>
</tbody>
</table>
The Magnitude of the Solution

Population Attributable Risk for ACE–related problems ranges from 20% to 80%

60% of History of Adult Incarceration is Attributable to ACES.
Intentional Layering

1. Geographic – differential help
2. Population (age or status)
3. Serendipity
4. Inside-Outside
5. Discipline-specific
6. Adaptation of programs
7. Incentives for ACE-informed innovation
8. Capacity Building Process – Engage the citizenry
9. Work the data: learn what works for whom in what context; monitor ACE prevalence; protect ACE scores
“Oregon is in the middle of transforming three of its largest service-delivery systems that impact children and families: health, education and early childhood.

Nothing more tangibly demonstrates the linkages between these three systems than the ACE Study.”

These transformations are guided by shared principals that are a convenient way to describe the uses of ACE science in Oregon.
Principles for ACE Application

1. Invest in resiliency and prevention – dual generation
2. Identify risk early; stop the escalation of adversity
3. Work across the life course
4. Build bridges across systems
5. Use data to inspire, support learning, drive decision making
6. Develop a skilled workforce
7. Empower self-organizing communities

Adapted from: *The Adverse Childhood Experience Study; How the Findings are Being Applied in Oregon*; David Mandell & Christy Cox, Ford Family Foundation
Lunch Time Debrief

- What Big Ideas are Missing?
- What Moved You? Surprised You? Affirmed Your Ideas or Perspective
- What Information/Discussion Impacted You
- What Strategies Will You Be Excited to Take Back To Your Agency/Group for More Discussion?
Annette

http://resiliencetrumpsaces.org/popups/video_annett.html
Macro Conditions

Macro Determinants

Micro Determinants

Social
Economic
Political

Living, Working, School Conditions
Social, Family, Community Networks

Biological Traits
Individual Behaviors
Access

Adapted from Institute of Medicine,
The Future of the Public's Health in the 21st Century,
Examples of ACE Application

Macro Conditions:
- Learning communities
- Social marketing for hope-filled action
- Policy to protect ACE scores
- Policy to equalize access
- Civic engagement re: norms
- Inclusion of marginalized groups

Macro Determinants:
- Investment in art, remembering culture
- Workplace safety
- Service innovation & evaluation
- Professional training
- Trauma audits
- Peer helping systems – Navigators, CHW
- Community organization & engagement

Micro Determinants:
- Program Innovation: add ACE-informed accommodations
- Multiple supports in relationship-based programming
- Linking programs with neighborhood and peer help
- Resilience-building during sensitive developmental periods
- Work universal systems

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- Program Innovation: add ACE-informed accommodations
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