Understanding Adverse Childhood Experiences

Building Self-Healing Communities

The ACE Study confirms, with scientific evidence that adversity during development increases the risk of physical, mental and behavioral problems later in life. The ACE Study and other research using the study's framework have taught us that ACEs are the leading cause of health and social problems in our nation and the most powerful determinant of the public's health.

Brain Development is Experience-Dependent and Sequential

The wiring of the brain – the making of complex neural networks – is experience dependent. What gets experienced the most tends to lead to more robust connections between nerve cells. Over time, these connections form robust networks. The least "experienced" connections tend to withdraw at about the time of puberty.

Experiences that cause stress chemicals to be continuously produced have a big impact on development of brain cells and the connections among cells. When stress hormones, like cortisol, are at high levels in the body for long periods of time they can be toxic to developing brain cells. This toxicity impacts the functioning of brain regions, hinders development of healthy neural networks, and can cause brain cells to die. When danger is episodic or long lasting during childhood, developing brains prepare and adapt to respond to the experiences of an unpredictable and dangerous world. The people whose brains adapt to a dangerous or stressful world are more likely to survive when life is tough; those whose brains adapt to a safe world are more likely to be prepared to meet society's expectations in tranquil times.

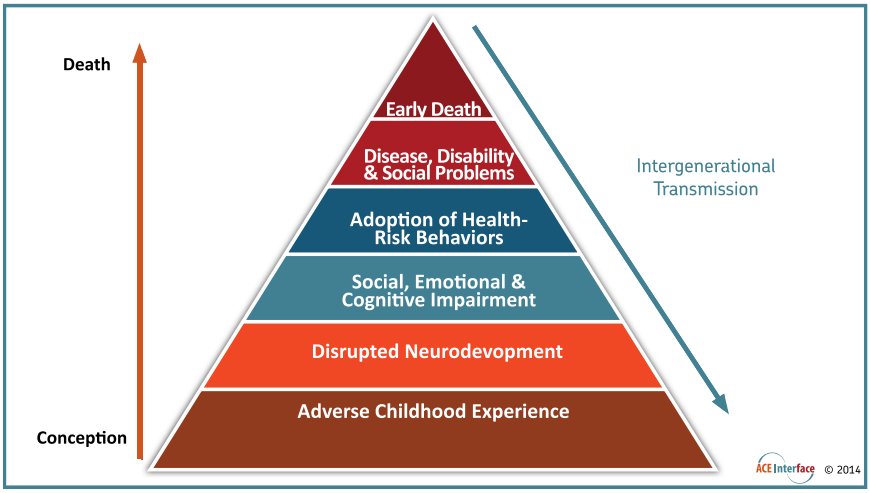
As the brain develops, there are sensitive periods for each brain region when the size and functional abilities of the region are most affected by experience and are most vulnerable to toxic stress. Stress may be interpreted by the brain as something we can tolerate and work through or as something that is overwhelming and requires an immediate response. In the latter case, a small amount of stress may be perceived as crisis. Our set-points for that interpretation are largely in place by early adulthood.

Toxic stress during childhood can effect processing of sound, development of verbal language, perception of social cues and facial expressions, ability to coordinate movement or to integrate rational ideas when in a highly emotional state. Toxic stress can effect brain interaction with body systems and lead to disease, disability and social/relational problems throughout the life course. *But childhood times are also windows of opportunity for building resilience – after all, the developing brain is sensitive to all kinds of experience.*

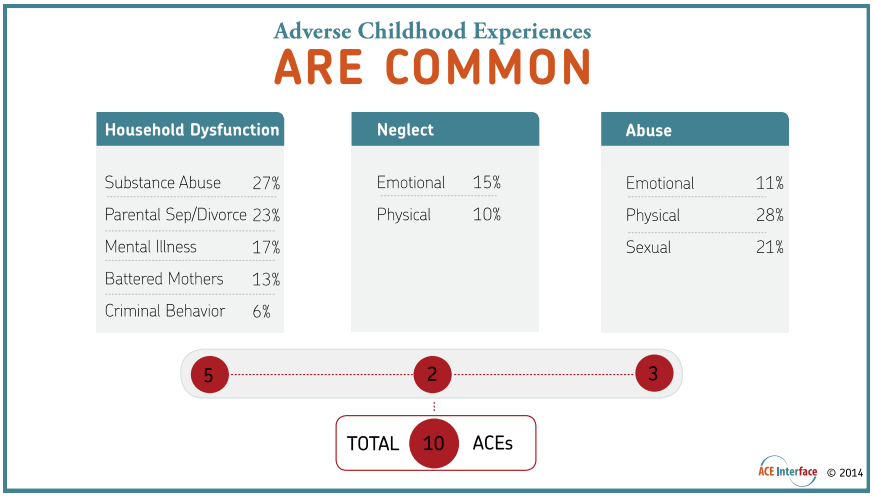
Human development is a magnificent dance of experience and adaptation generating age-appropriate capacities for feeling, thinking and responding to the world around us.

The ACE Study

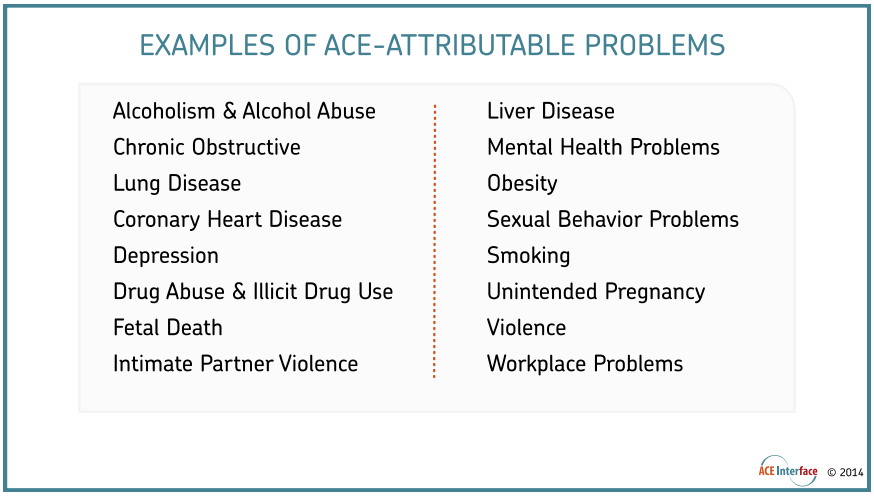
The ACE Study considers the effects of childhood adversity on population health and wellbeing. A partnership between Kaiser Permanente in San Diego and the Centers for Disease Control and Prevention in Atlanta, The ACE Study takes a broad public health perspective of the effects of multiple forms of childhood adversity on population health. The ACE Study is the largest of its kind, with over 17,000 participants.



The ACE Pyramid (top right) represents the life course model of the ACE Study: ACEs disrupt neurodevelopment, which in turn leads to social-emotional and cognitive adaptations that can then lead to risk factors for major causes of disease, disability, social problems, and early death. The ACE Study is designed to help us understand how Adverse Childhood Experiences influence human development and life course health in predictable ways.



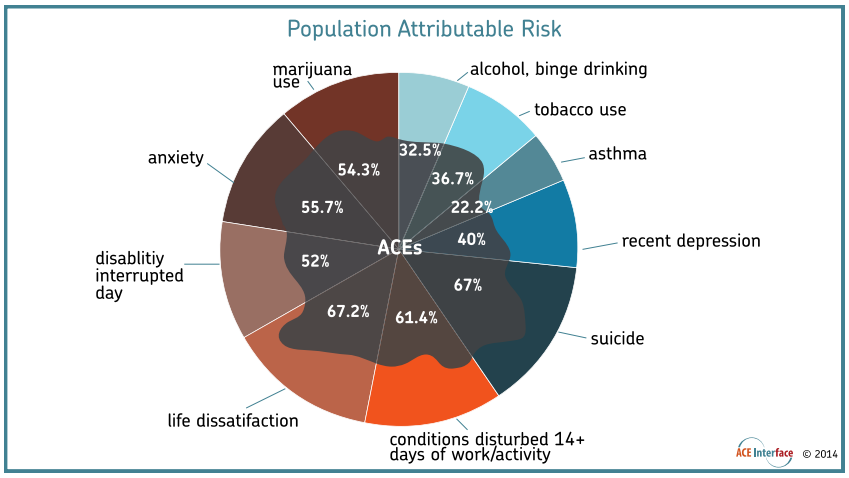
The ACE Study considers ten categories of childhood adversity (middle right). Study findings include:



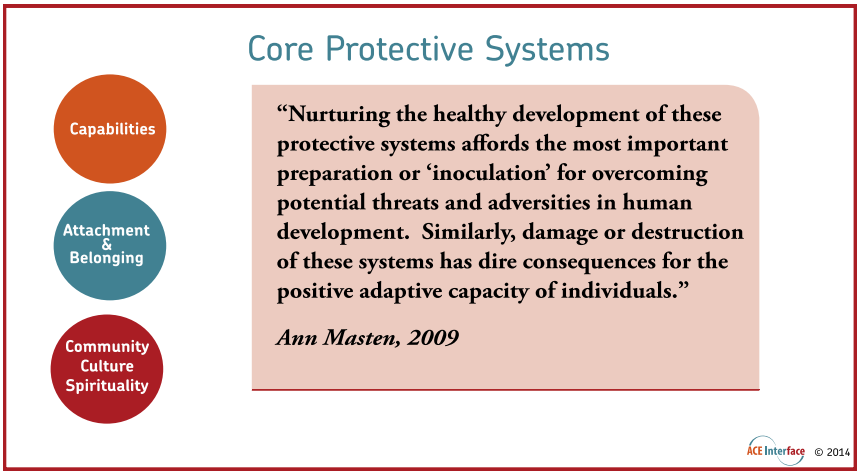
1. **ACEs are common across all socio-economic and culture/ethnicity lines.**
2. **ACEs are interrelated.**
3. **ACE accumulation has a powerful impact on public health.**
4. **ACEs tend to be held in the body, leading to mental, physical, and behavioral health problems throughout the life course.** (lower right)

As the ACE Score goes up the risk of many health and social problems goes up in a "dose-response" fashion. As a result, as the ACE Score goes up in a population, the percent of people with these problems also goes up. It is also important to understand that some of those problems become ACEs for the next generation—thereby perpetuating the cycle of adversity and their attendant problems.

ACE Prevention: Our Powerful Legacy
ACE Prevention is the greatest opportunity for improving the well-being of human populations. ACEs are considered the most powerful determinant of the public's health because of the breadth of impacts – from heart disease to homelessness, from depression to violence – and because of the large percent of each of these problems that are attributable to ACEs.



Epidemiologists use a standard statistical calculation to estimate the amount of a disease or condition that is caused by a disease agent – called the Population Attributable Risk. The dark area in the center of the graphic (upper right) represents the portion of each condition that is attributable to ACEs – from 22% of asthma to 67% of life dissatisfaction. As we are successful preventing accumulation of ACEs in the next generation, we will reduce all ACE-attributable problems accordingly.



Protective Systems Promote Resilience
Three protective systems interact and guide positive adaptation: 1) individual capabilities, 2) attachment and belonging, and 3) community, faith, and cultural processes. These three systems are nested: people do best when they are living in flourishing families and communities.

People most affected by ACEs are leading formation of *Self-Healing Communities* that have a rhythm of engagement that includes:

1. **Safe and regularly scheduled ways of coming together for belonging and cooperative action,**
2. **Networked social and inter-organizational processes characterized by learning, reciprocity, social bridging, and efficacy,**
3. **Shared times and venues for critical reflection and decision making about hope-filled action,**
4. **Continuous expansion of opportunities for informal and formal leadership.**

Building Self-Healing Communities is about investing in the people who have the most at stake—especially people affected by ACEs-- so they can be expert leaders of their own community's change. We live at a time of great hope and promise – the greatest public health discovery of our time is about us. The ACE Study provides a discovery – a common framework and language – that we can use to profoundly improve the health and well-being of our society now and for future generations to come