

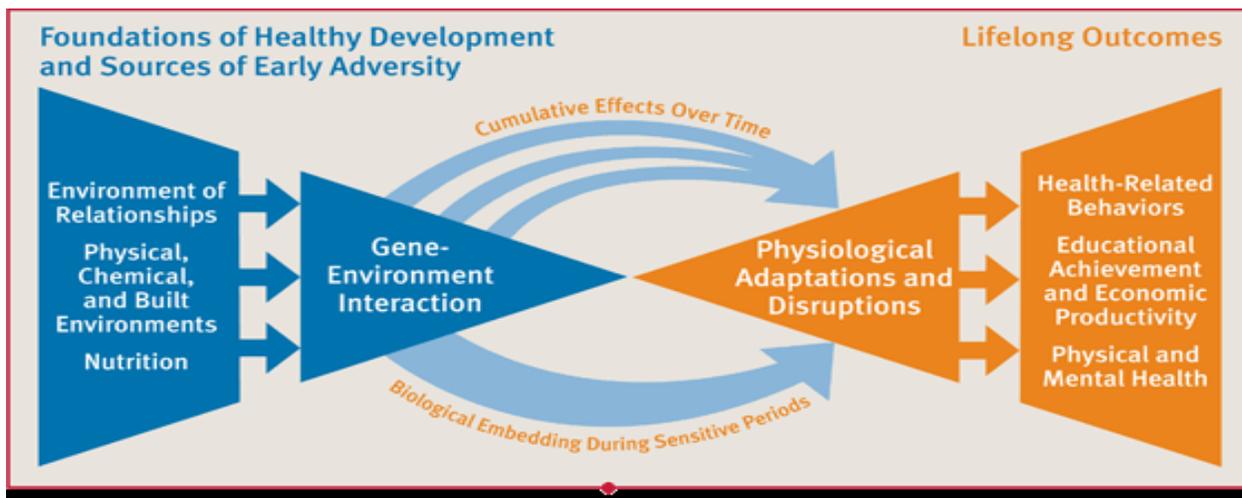
## The Science of Childhood Trauma as a Driver of Chronic Illnesses

### Essential Facts

- Chronic diseases drive the majority of medical costs and have even broader impact on overall productivity and wellbeing.
- Exposure to trauma and toxic stress is an important driver of the rates of chronic illness.
- There appear to be two main processes for the development of chronic illness:
  - Biological embedding of early experiences
  - Cumulative wear and tear of the physical and social environment on the brain and body that compromises the neuroendocrine, autonomic, metabolic and immune systems, resulting in chronic inflammation
- Epigenetic influences allow rapid changes in gene expression in reaction to changes in the physical and social environments. Essentially, traumatic events may switch on or off certain genes, creating a “genetic memory” that is passed on to the next generation.
- We have a substantial science base regarding effective prevention and treatment of traumatic exposure and its consequences.
- We need a coordinated effort to address the impact of traumatic experiences and assure that promising treatment technologies are effectively deployed across government, private and public sectors and are available for everyone.

### Chronic Illnesses

- Chronic illnesses such as diabetes, cardiac disease, stroke, lung disease, cancer, autoimmune diseases and mental illnesses accounted for over 85% of all health care expenditures <sup>1</sup> totaling over 2.7 trillion dollars (15% of GDP in 2015).
- The non-health related economic impact of the most common chronic diseases is estimated at 1 trillion dollars annually in the US and slated to grow to 6 trillion by mid-century <sup>2</sup>
- The US ranks near the bottom of industrialized nations in general health status.<sup>3</sup>
- The US has the highest rates of mental illness in the world.<sup>4</sup>



## Root Causes

During the last two decades we have gained important insights into the root causes of many of these problems. They are the long term results of suboptimal child development that affect most areas of human health and functioning as depicted in the model above<sup>5</sup>.

New science is helping us to understand the interaction of a person’s genetics and their environment in promoting healthy development. If the environment involves the exposure to “frequent, and/or prolonged adversity—such as physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family economic hardship—without adequate adult support” children are at risk<sup>6</sup>. This toxic stress results in changes to the architecture of the brain that affect behaviors, emotions and thinking with related effects on educational achievement and later success at work. Poor academic and occupational status results in reduced socioeconomic status with an associated increase in chronic illnesses. Stress hormones related to toxic stress exposure underwrite the brain changes and can operate through changes in gene expression. These effects have been demonstrated in a large number of studies. They were clearly demonstrated in the CDC’s Adverse Childhood Experiences study which found that exposure to 4 or more types of adverse experiences in childhood increases the risk of:

- Alcoholism by 7.4 times
- Drug abuse by 10.4 times
- Suicide Attempts by 12.2 times
- Depression by 4 times
- Diabetes 1.6 times
- Cancer 1.9 times
- Ischemic Heart Disease by 2.2 times
- Chronic Lung Disease by 3.9 times

Unfortunately, exposure to adverse childhood experiences is quite common in the U.S. Based on multiple national surveys of children's exposure to violence<sup>7</sup>, nearly two-thirds (60.6%) of children and youth ages 2 to 17 years directly experience or were witness to one or more victimizations each year. Among the most serious:

- 1 in 10 (10.2%) experienced child maltreatment;
- 1 in 10 (10.2%) experienced a victimization injury;
- 1 in 16 (6.1%) experienced sexual victimization.

A large number of independent studies show a consistent and graded relationship between exposure to trauma and toxic stress and poor health, mental health, academic and occupational functioning as well as several other important areas of wellbeing. Ameliorating the medical and societal costs that are associated with the development of these chronic illnesses requires addressing their root causes.

## Science Base in Prevention and Treatment

Fortunately, our research investments have yielded a large number of preventive and treatment approaches that can both reduce exposure to and treat the effects of toxic stress as well as promote resilience. Beginning after conception and continuing throughout development, effective interventions promote healthy development and well-being and reduce the frequency of behaviors (such as alcohol and tobacco use) known to be associated with the development of chronic health conditions. For example:

- Parent education programs. These programs provide education to parents outside of the home and prevent harmful parenting practices, improve attitudes about child rearing, and reduce depression and stress among children.<sup>8 9 10</sup>
- Home visitation programs. These programs involve a nurse, a social worker, or other trained professional visiting high-risk households and prevent child abuse and neglect.<sup>11 12 13</sup>
- Dual substance abuse treatment and parenting programs. These programs treat parents' substance abuse problems while also cultivating positive parenting skills and have been shown to improve outcomes for children.<sup>14</sup>
- Evidence based treatments. A number of evidence based treatments are effective for children, adolescents and adults who have been exposed to childhood trauma.<sup>15</sup>

Many of these interventions strengthen the attachment between parents, children and their schools and communities and promote resilience and emotional wellbeing needed for success. They can help to alleviate some of the long term effects of poverty, a changing economy and other social conditions that increase exposure to toxic stress.

It is not surprising that interventions like these save money. Based on summaries of rigorous research, the Washington State Institute of Public Policy has estimated the long-term cost/benefit ratios of preventive and treatment interventions<sup>16</sup>. For example:

- The Seattle Social Development program, which has shown 20 year impacts from an elementary school intervention, is estimated to return over 4 dollars for every dollar invested.
- The Triple P Positive Parenting programs reduces the rate of child maltreatment and has several other benefits for the developing child. It returns over \$7 dollars for each dollar invested
- Cognitive behavioral therapy for post-traumatic stress disorder is estimated to return \$88 dollars for every dollar invested.
- PTSD prevention following traumatic exposure returns over 6 dollars per dollar invested.

## Coordinated Leadership is Needed

As with many areas of medicine and human services, these preventive and treatment technologies are not universally available. Multiple investments across both the public and private sectors deal with aspects of these problems, but they do so outside of a comprehensive framework to assess the quality of the interventions or their impact. Efforts in communities across the nation may serve as a model for the value of a trauma-informed lens in aligning interests and perspectives to address our contemporary challenges of addressing the underlying causes and substantial costs of chronic illnesses. Given the deteriorating state of wellbeing in our country, the need to move effectively at state, local and national levels is clear. The science is available to guide our action. We need the political will and enabling structures to press the science into action.

## Acknowledgments

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## Notes

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- 2 <http://www.milkeninstitute.org/publications/view/618>
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