APPENDIX U

January 5, 2016

Human Services Committee Meeting

Capital Building. Bismarck, North Dakota

Madame Chairperson and Members of the Human Services Committee,

My name is Kathy Anderson and I am a general pediatrician, Chair of the Department of Pediatrics at St. Alexius Medical Center, Treasurer of the North Dakota American Academy of Pediatrics, Assistant Professor of Pediatrics for UND School of Medicine, consultant pediatrician to North Dakota, HRSA Early Childhood Comprehensive Systems grant aimed at improving general developmental and social-emotional screening to children aged 0-3, and a member of the Task Force on Substance Exposed Infants formed under Senate Bill 2367.

Thank you for inviting me here to speak on behavioral health issues in children 0-6yo. While I cannot give a comprehensive presentation on this topic in the time allotted, what I will try to do is reframe this discussion highlighting how new scientific evidence has reshaped how we understand health and disease in pediatrics and across the lifespan. I hope that this will better inform our decision making from not just a clinical, but also a legislative perspective.

As a physician caring for children, my practice of medicine is very different from a physician who cares for adults. The focus is not on treating the disease, or adjusting bad habits, the focus is on optimizing health, wellness, and development through instilling the importance of a nurturing environment and good habits right from the start. This is how I would recommend that we frame the discussion around early childhood mental health and wellness.

The early childhood period, from birth to 3-5yo, is a period of rapid growth and development unmatched by any other stage in human development. The Harvard Center on the Developing Child is at the forefront of decades of scientific research supporting the importance of this critical period for learning and development, physical and mental health in children and adults, as well as the health of populations and communities. Most of us have probably witnessed the rate at which babies and toddler grow and learn new things. Babies often double their birthweight by 4 months and triple it by a year of age. 700 New Neural Connections are formed every second and what mediates this formation are serve and return interactions between baby and his or her caregiver. Early experiences have lasting impacts on the trajectory of success in school and life. At 18 months of age, we start to see disparities in vocabulary that widen significantly by the time the child is 3 years old.

For children, their development is a vital sign – that is, it is an indicator of their overall health. Development is made up of gross motor, fine motor, speech, and social emotional development. Delays in development can occur for various reasons including differences in genes or genetic syndromes, trauma – in utero, during delivery, or during childhood and for other reasons. This trauma can be include vascular trauma like a stroke, physical trauma as in accidents or abuse, neglect and toxic

exposures (illicit or prescription drugs). Trauma can be a one-time event such as is the case in birth trauma or a motor vehicle accident, or it can be ongoing as is often the case in physical, emotional, or sexual abuse, neglect, or children living in homes where there is domestic violence, untreated mental health issues, or substance abuse.

These sources of ongoing trauma were studied in the Adverse Childhood Experiences (ACEs) study. Between 1995 and 1997, Kaiser Permanente HMO enrolled over 17,000 adults in this "study where they asked about childhood experiences of abuse, neglect, and family dysfunction. The findings of this study suggest that certain experiences are major risk factors for leading causes of illness and death as well as poor quality of life in the United States , "(CDC). Since this study, breakthroughs in the fields of neuroscience, epigenetics, and developmental pediatrics, as well as what we have come to understand about the physiology of stress, have allowed us to understand more about the mechanism by which childhood trauma effects physical and mental health across the lifespan.

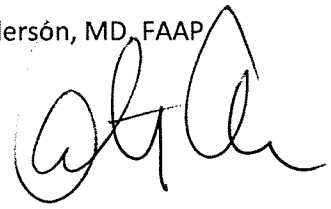
Ongoing trauma can lead to toxic stress. There are three responses to stress a positive stress response – which is a brief episode of stress such as giving a presentation or a performance, physiologically categorized by mild elevations in HR and stress hormones. Tolerable stress is a serious stressor like the loss of a loved one, or a frightening injury which unchecked could cause a toxic response, but what makes it tolerable is the fact that it is buffered by at least one strong adult relationship. Toxic Stress occurs when a serious stressor occurs or there are frequent or prolonged stressors without adequate adult support.

Advances in Neuroscience have shown us that toxic stress disrupts the development of brain architecture. In other words, toxic stress physically changes how our brain forms, and some parts of it are larger or smaller in response to ongoing or toxic stressors. Advances in Epigenetics have shown us that toxic stress affects the way our genes are turned on and off. We used to believe that our destiny was determined either by our genes, or by our experiences – the nature/nurture debate, but now, we understand, that our experiences have the power of turning on or off genes that we may carry. And what we have found is that toxic stress is the mechanism by which adverse childhood experiences lead to illness and death in adolescents and adults via cognitive impairments that affect executive function and regulation as well as good decision-making, and stress related diseases such as heart disease, diabetes, cancer, anxiety, depression and substance abuse. Toxic Stress is also a mechanism by which delays in development, difficulties with learning, and behavioral issues present themselves in childhood.

In my clinical practice in North Dakota, there has been a sharp increase in substance exposed infants over the past 6 years, most notably over the past 3 years, and this has been observed by pediatricians across the state as it was discussed in an NDAAP meeting 2 years ago. The concern with these babies is not only the in utero toxins that they may have been exposed to, but the other concurrent risk factors such as substance abuse and untreated mental illness in a caregiver, domestic violence in household, poverty that may otherwise set them up for having delays in development and learning. These children and families need significant support and services in order to optimize outcomes for the child. And the success of the child's development is going to be intimately linked to parents' ability to access appropriate services and support for themselves.

Of course, as a pediatrician, my biases are obvious... I am a strong and unwavering child advocate. But I have significant scientific research to support by natural sensibility. Investing the most time and resources into the greatest critical growth period of our children will reduce harm, minimize spending, and optimize outcomes for our children and our community.

Kathy Andersón, MD, FAAP



FIVE NUMBERS TO REMEMBER ABOUT EARLY CHILDHOOD DEVELOPMENT

700 PER SECOND

18 MONTHS

90-100%

3:1 ODDS

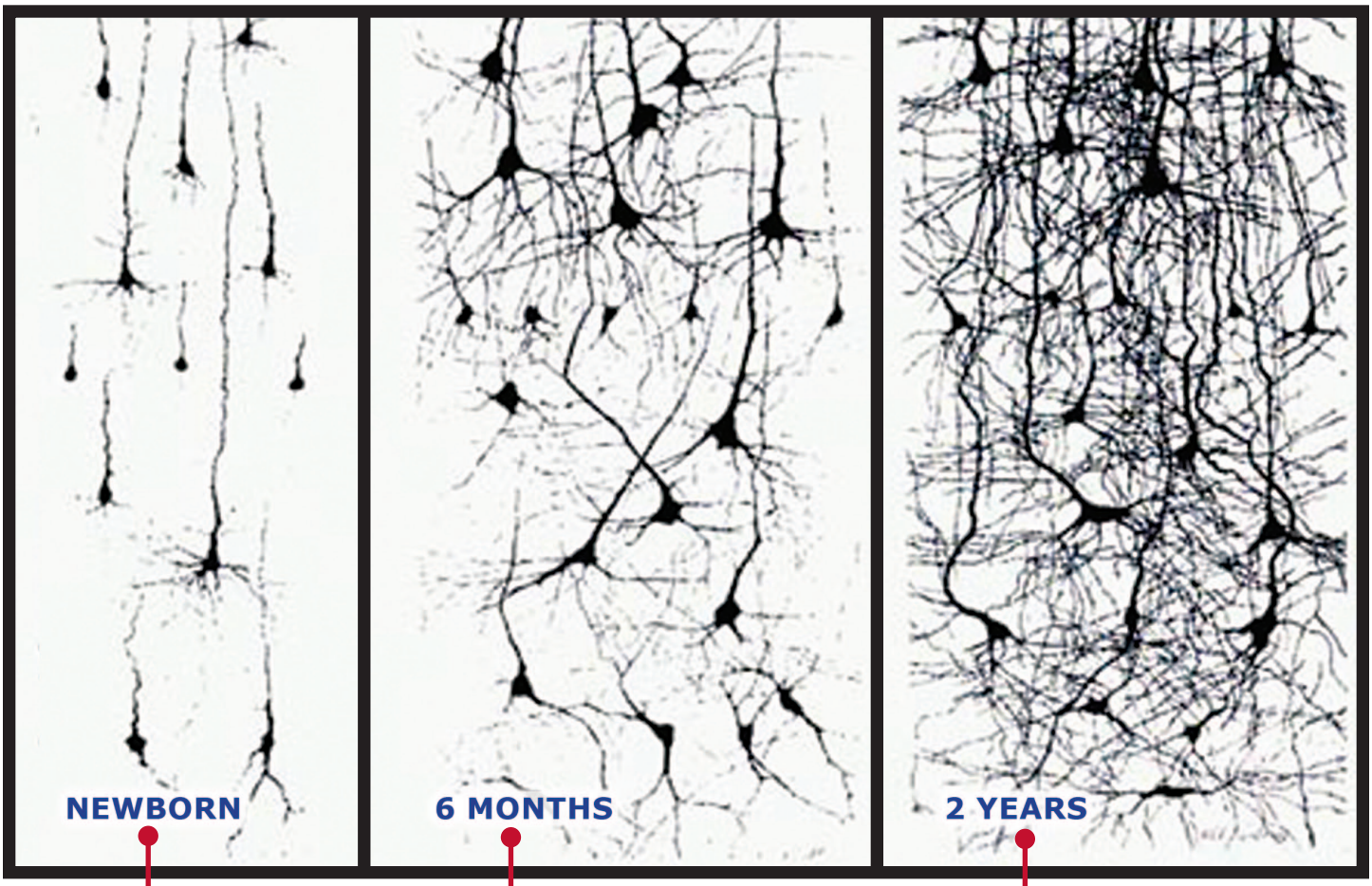
4-9 DOLLARS

This feature highlights five numbers to remember about the development of young children. Learn how the numbers illustrate such concepts as the importance of early childhood to the learning, behavior, and health of later life and why getting things right the first time is easier and more effective than trying to fix them later. This feature is also available in a web-based slideshow format at http://developingchild.harvard.edu/resources/multimedia/interactive_features/five-numbers/

For more resources from the Center on the Developing Child at Harvard University visit http://developingchild.harvard.edu/resources/

FIVE NUMBERS TO REMEMBER ABOUT EARLY CHILDHOOD DEVELOPMENT

700 NEW NEURAL CONNECTIONS PER SECOND

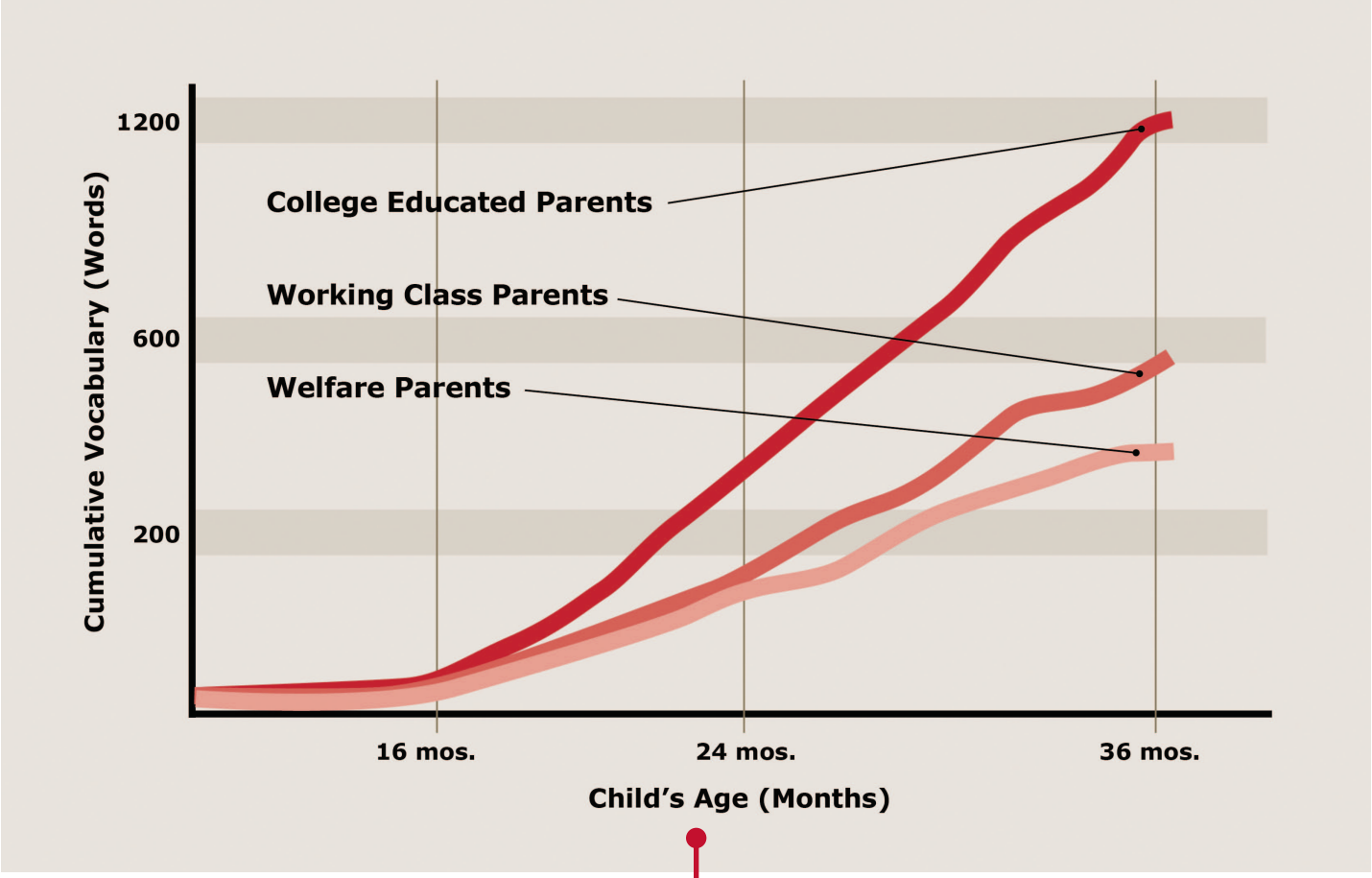


1

The early years matter because, in the first few years of life, 700 new neural connections are formed every second. Neural connections are formed through the interaction of genes and a baby's environment and experiences, especially "serve and return" interaction with adults, or what developmental researchers call contingent reciprocity. These are the connections that build brain architecture – the foundation upon which all later learning, behavior, and health depend.

Image source: Conel, JL. The postnatal development of the human cerebral cortex. Cambridge, Mass: Harvard University Press, 1959

18 18 MONTHS: AGE AT WHICH DISPARITIES IN VOCABULARY BEGIN TO APPEAR



2

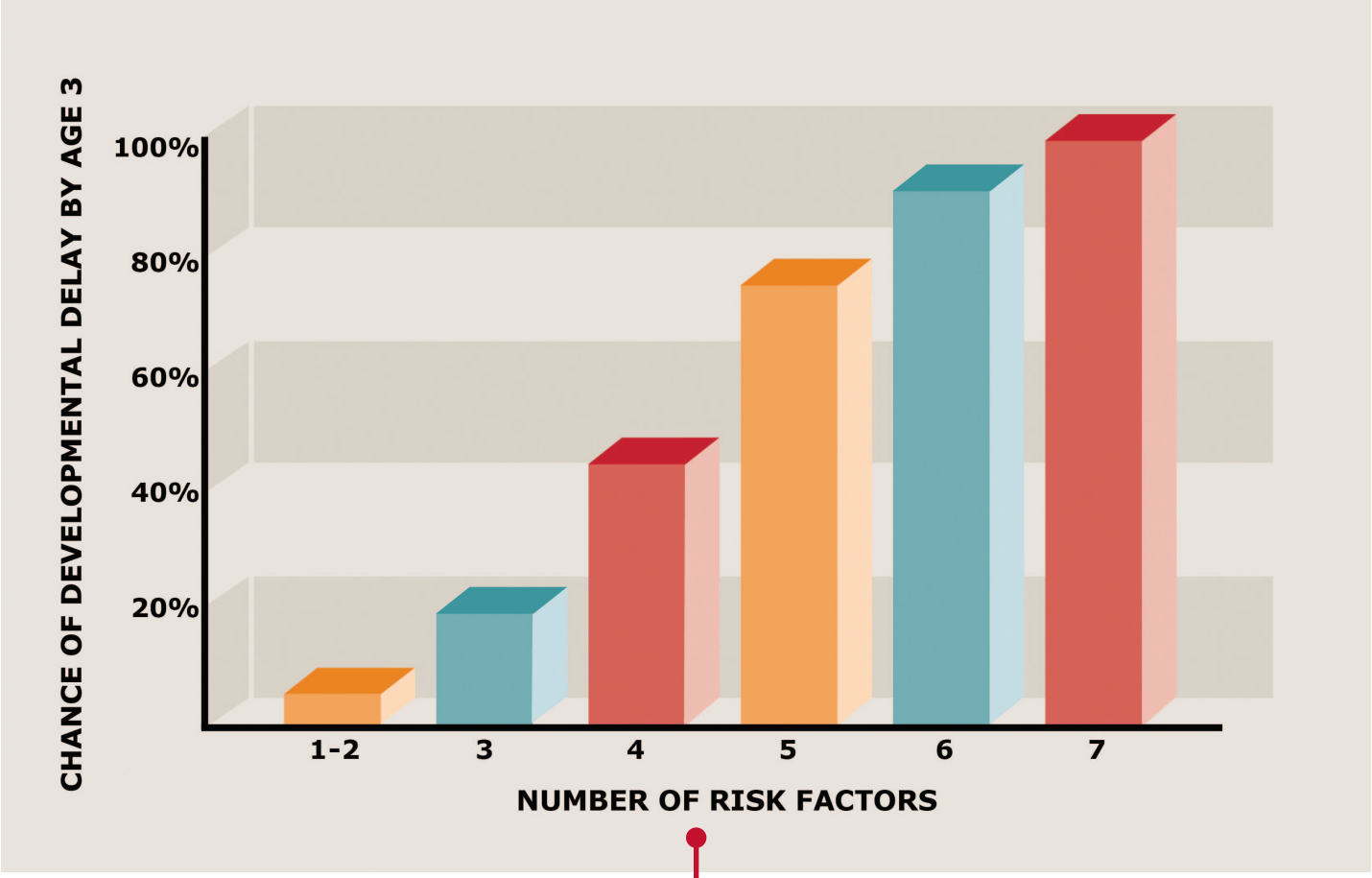
Early experiences and the environments in which children develop in their earliest years can have lasting impact on later success in school and life. Barriers to children's educational achievement start early, and continue to grow without intervention. Differences in the size of children's vocabulary first appear at 18 months of age, based on whether they were born into a family with high education and income or low education and income. By age 3, children with college-educated parents or primary caregivers had vocabularies 2 to 3 times larger than those whose parents had not completed high school. By the time these children reach school, they are already behind their peers unless they are engaged in a language-rich environment early in life.

Source: Hart, B., & Risley, T. (1995). Meaningful differences in the everyday experiences of young American children. Baltimore, MD: Brookes.

FIVE NUMBERS TO REMEMBER ABOUT EARLY CHILDHOOD DEVELOPMENT

90-100

90-100% CHANCE OF DEVELOPMENTAL DELAYS WHEN CHILDREN EXPERIENCE 6-7 RISK FACTORS



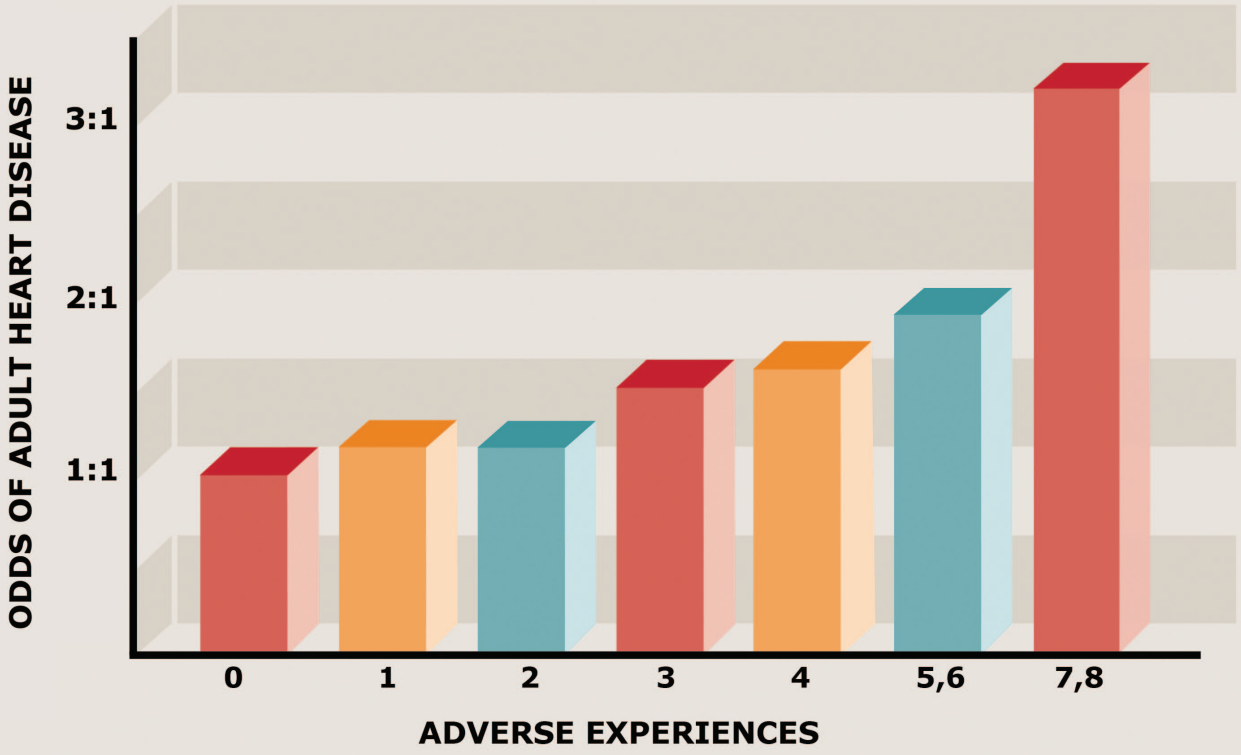
3

Significant adversity impairs development in the first three years of life—and the more adversity a child faces, the greater the odds of a developmental delay. Indeed, risk factors such as poverty, caregiver mental illness, child maltreatment, single parent, and low maternal education have a cumulative impact: in this study, maltreated children exposed to as many as 6 additional risks face a 90-100% likelihood of having one or more delays in their cognitive, language, or emotional development.

Source: Barth et al. (2008)

FIVE NUMBERS TO REMEMBER ABOUT EARLY CHILDHOOD DEVELOPMENT

3:1 3:1 ODDS OF ADULT HEART DISEASE AFTER 7-8 ADVERSE CHILDHOOD EXPERIENCES



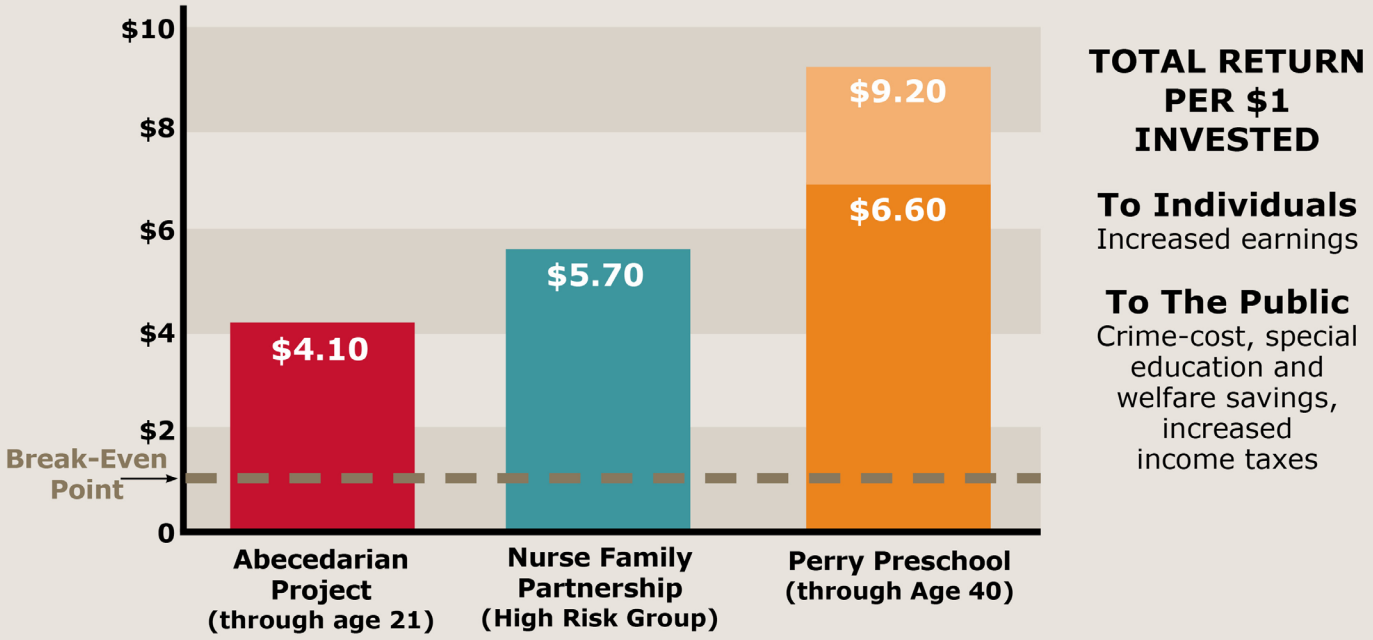
4

Early experiences actually get into the body, with lifelong effects—not just on cognitive and emotional development, but on long term physical health as well. A growing body of evidence now links significant adversity in childhood to increased risk of a range of adult health problems, including diabetes, hypertension, stroke, obesity, and some forms of cancer. This graph shows that adults who recall having 7 or 8 serious adverse experiences in childhood are 3 times more likely to have cardiovascular disease as an adult. And children between birth and three years of age are the most likely age group to experience some form of maltreatment–16 out of every thousand children experience it.

Source: Dong et al. (2004)

FIVE NUMBERS TO REMEMBER ABOUT EARLY CHILDHOOD DEVELOPMENT

4–9 $4 - $9 IN RETURNS FOR EVERY DOLLAR INVESTED IN EARLY CHILDHOOD PROGRAMS



5

Providing young children with a healthy environment in which to learn and grow is not only good for their development—economists have also shown that high-quality early childhood programs bring impressive returns on investment to the public. Three of the most rigorous long-term studies found a range of returns between $4 and $9 for every dollar invested in early learning programs for low-income children. Program participants followed into adulthood benefited from increased earnings while the public saw returns in the form of reduced special education, welfare, and crime costs, and increased tax revenues from program participants later in life.

Sources: Masse, L. and Barnett, W.S., A Benefit Cost Analysis of the Abecedarian Early Childhood Intervention (2002); Karoly et al., Early Childhood Interventions: Proven Results, Future Promise (2005); Heckman et al., The Effect of the Perry Preschool Program on the Cognitive and Non-Cognitive Skills of its Participants (2009)

WHAT THESE FIVE NUMBERS TELL US

700 PER SECOND

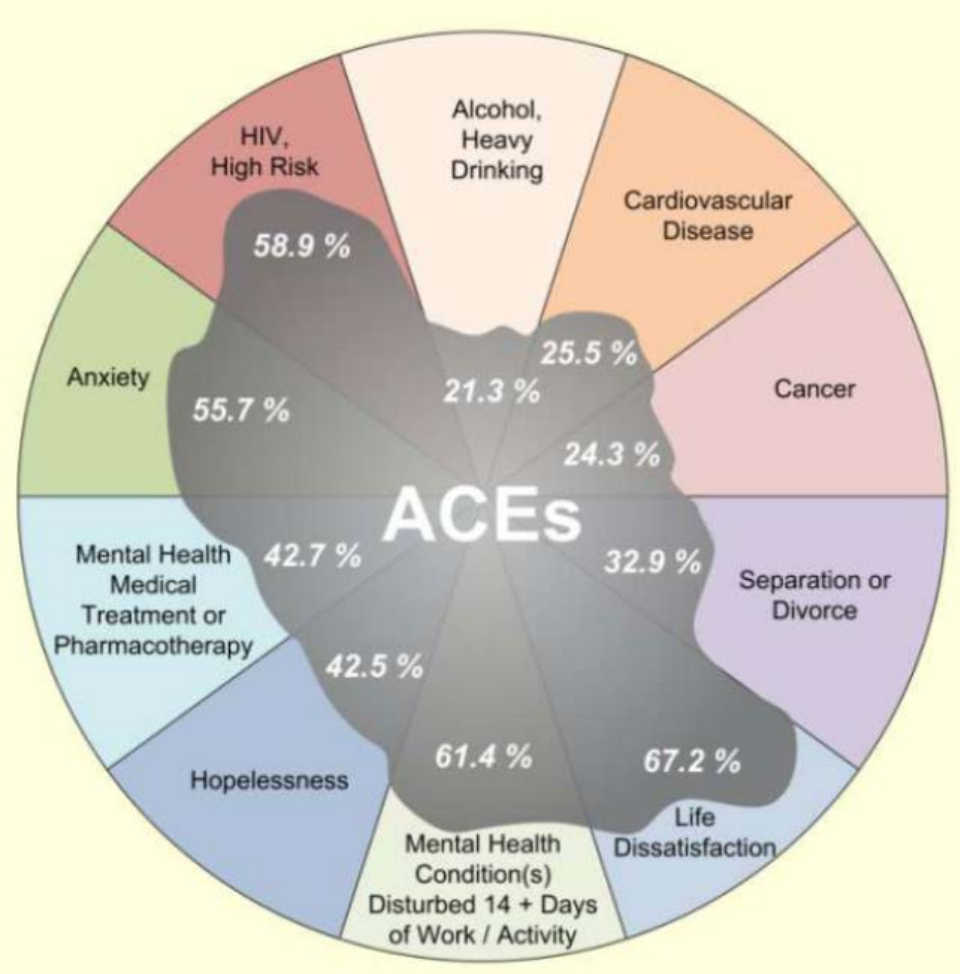
18 MONTHS

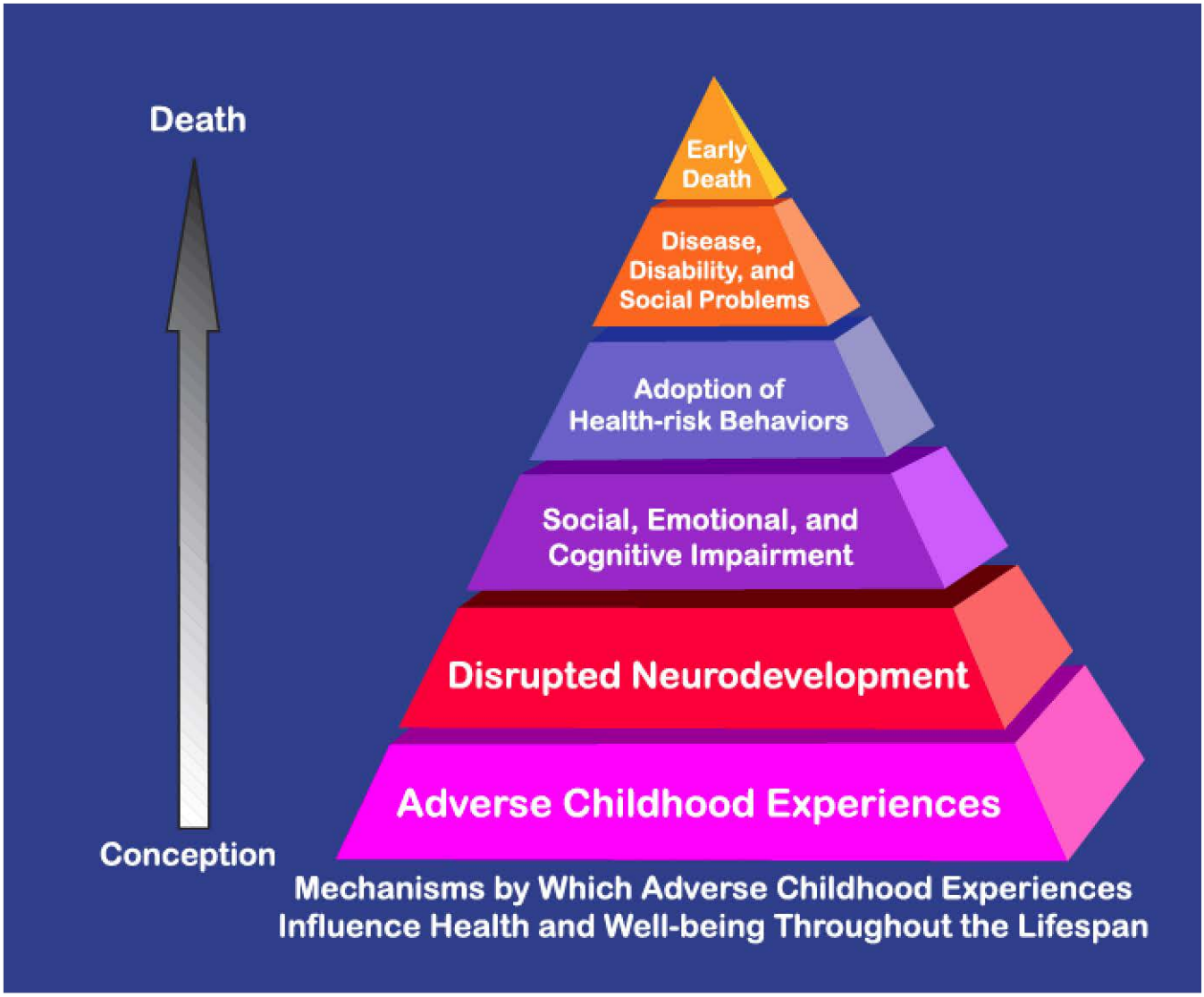
90-100%

3:1 ODDS

4-9 DOLLARS

1. Getting things right the first time is easier and more effective than trying to fix them later.
2. Early childhood matters because experiences early in life can have a lasting impact on later learning, behavior, and health.
3. Highly specialized interventions are needed as early as possible for children experiencing toxic stress.
4. Early life experiences actually get under the skin and into the body, with lifelong effects on adult physical and mental health.
5. All of society benefits from investments in early childhood programs.


HIV, High Risk
Alcohol, Heavy Drinking
Cardiovascular Disease
Anxiety
Cancer
Mental Health Medical Treatment or Pharmacotherapy
Separation or Divorce
Hopelessness
Mental Health Condition(s) Disturbed 14 + Days of Work / Activity
Life Dissatisfaction
ACEs
58.9 %
25.5 %
21.3 %
55.7 %
24.3 %
42.7 %
32.9 %
42.5 %
61.4 %
67.2 %



Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan