

Understanding the Science of Determinants of Health and ACEs to Improve Children's Health

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UCSF Benioff Children's Hospital
Oakland

Center for Community
Health and Engagement

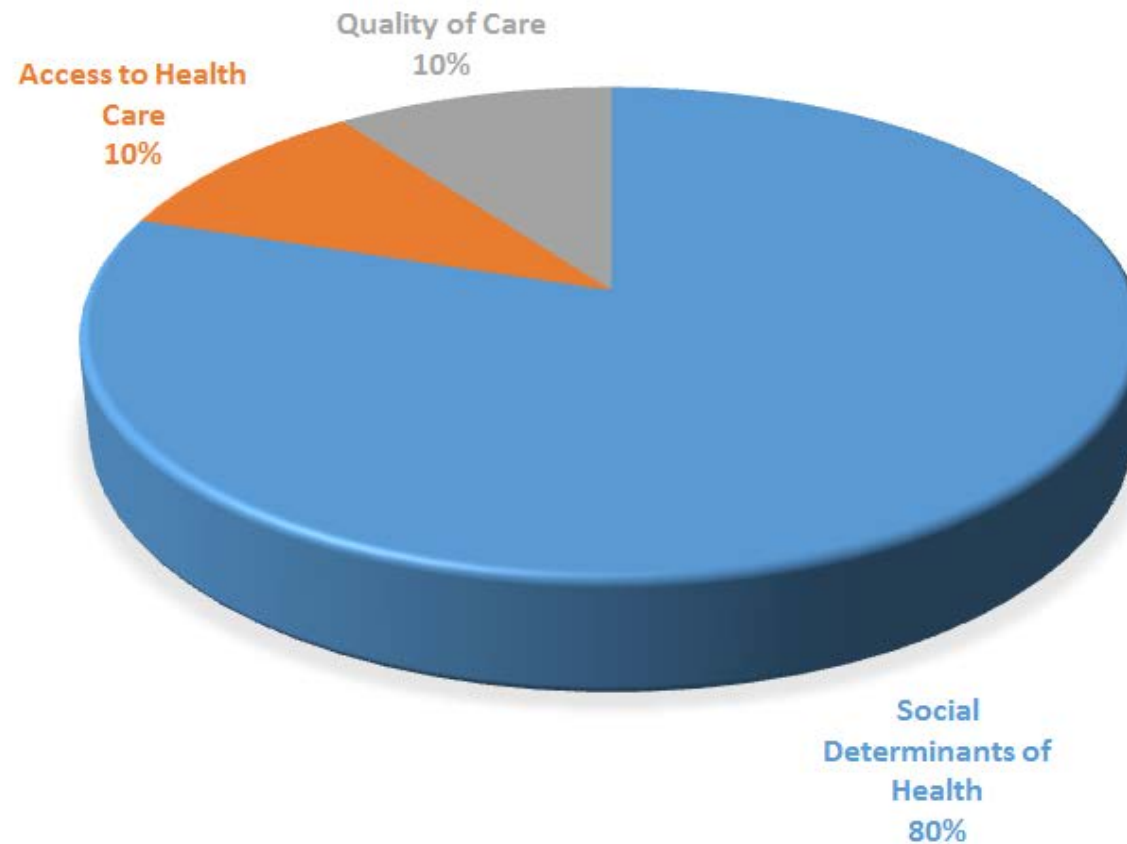
Disclosures

- I have no conflicts of interest

AGENDA

- Learn how DOH and ACES are grounded in the science
- See how DOH and ACEs impact clinical health outcomes
- Explore preventative clinical practice models

WHAT DETERMINES HEALTH?



Compared to a white child in the affluent Oakland Hills, a black child born in the flatlands is...

INFANT

2 times more likely to be born low birth weight

12 times less likely to have a mother who graduated from college

CHILD

13 times more likely to live in poverty

4 times less likely to read at grade level

ADULT

5 times more likely to be unemployed

3 times more likely to die of stroke

Cumulative impact: 14 year difference in life expectancy

Source: Alameda County Vital Statistics files, 2010-2012

iScreen Study

Amongst UCSF Benioff Children's Hospital Oakland
Emergency Department



Laura Gottlieb, Danielle Hessler, Dayna Long, Anais Amaya and Nancy Adler. A Randomized Trial on Screening for Social Determinants of Health: the iScreen Study. Pediatrics; originally published online November 3, 2014

Care Coordination around Social Needs Screening and Intervention

Primary research goal

- Examine the comparative effectiveness of two social needs interventions intended to decrease social needs and improve health

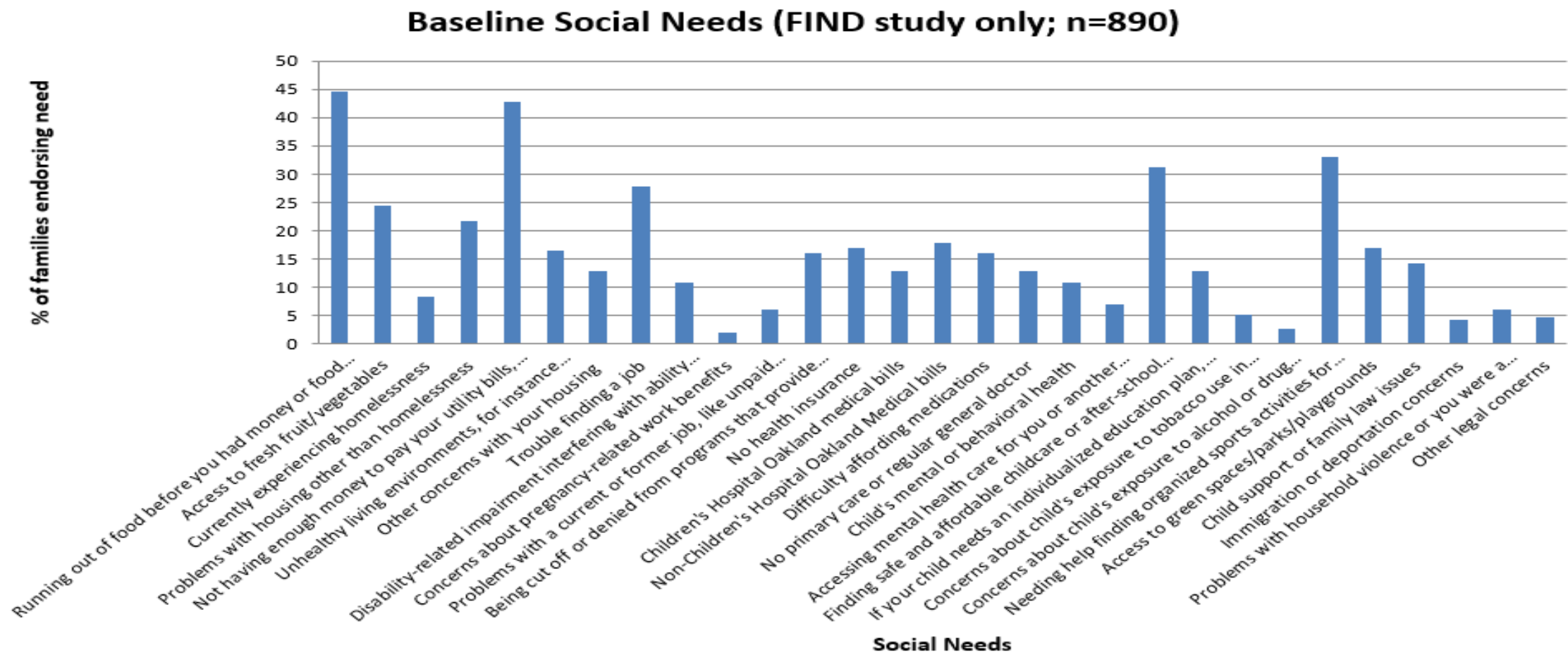
Results

- Less than 17 % of families reported being asked about unmet needs in the last year and of these families, less than half (43.2%) received a referral to help with non-medical needs.
- In the intervention group, we resolved at least one unmet social need
- In the intervention group improved reported child health
- On a 10 point pt satisfaction scale we scored +9/10

Laura Gottlieb, Danielle Hessler, Dayna Long, Ellen Laves, Abigail R. Burns, Anais Amaya, BA, Patricia Sweeney, Christine Schudel, Nancy E. Adler. . Effects of Social Needs Screening and In-Person Service Navigation on Child Health A Randomized Clinical Trial. JAMA Pediatric. doi:10.1001/jamapediatrics.2016.2521. Published online September 6, 2016.

Care Coordination around Social Needs Screening and Intervention

Amongst UCSF Benioff Children's Hospital Oakland Urgent Care and Primary Care Clinics



Improving Child Health

ER Sub-Group Analysis

Of patients in the intervention arm in the acute/urgent care setting,

1. larger increase in resolving unmet need- utility bills, food, and housing
2. there was an significant in improvement in parent-reported child health status

Changes in child health were partially mediated by changes in social needs

- Gottlieb L, Hessler D, Long D, Laves E, Burns A, Amaya A, Schudel C, Sweeney P, Adler N. Are acute care settings amenable to addressing patient social needs: A sub-group analysis. *Am J Emerg Med*. 2018 Mar 16 pii: S0735-6757(18)30226-2. doi: 10.1016/j.ajem.2018.03.034.

Adverse Childhood Experiences (ACES)

ACES leads to poor health such as obesity, diabetes, cancer and depression



3 Types

- Abuse: physical, emotional, sexual
- Neglect: physical and emotional
- Household Dysfunction: mental illness (depression), domestic violence, divorce, drug use, prison

Dube SR, Fairweather D, Pearson WS, Felitti VJ, Anda RF, Croft JB.
Cumulative childhood stress and autoimmune disease External Web Site
Icon. Psychom Med 2009;71, 243–250.

ACES >4

- 12.2 times as likely to attempt suicide
- 10.3 times as likely to use drugs
- 7.4 times as likely to be alcoholic
- 2.4 times as likely to have heart disease
- 1.9 times as likely to have cancer
- 1.6 times as likely to have diabetes



Children Who Experience 4 or more ACEs:

32x

Learning and
Behavioral
Problems

4.5x

Depression

2-3x

Asthma,
Heart Disease
and Cancer

3.5x

Pulmonary Disease

7 out of **10**

Leading Causes of Death in the
U.S. correlate with exposure to
4 or more ACE's

10-12x

greater risk for
Intravenous Drug Use
and Attempted Suicide

CDC-Kaiser Permanente ACEs Study, 1995-97

Where to Start?

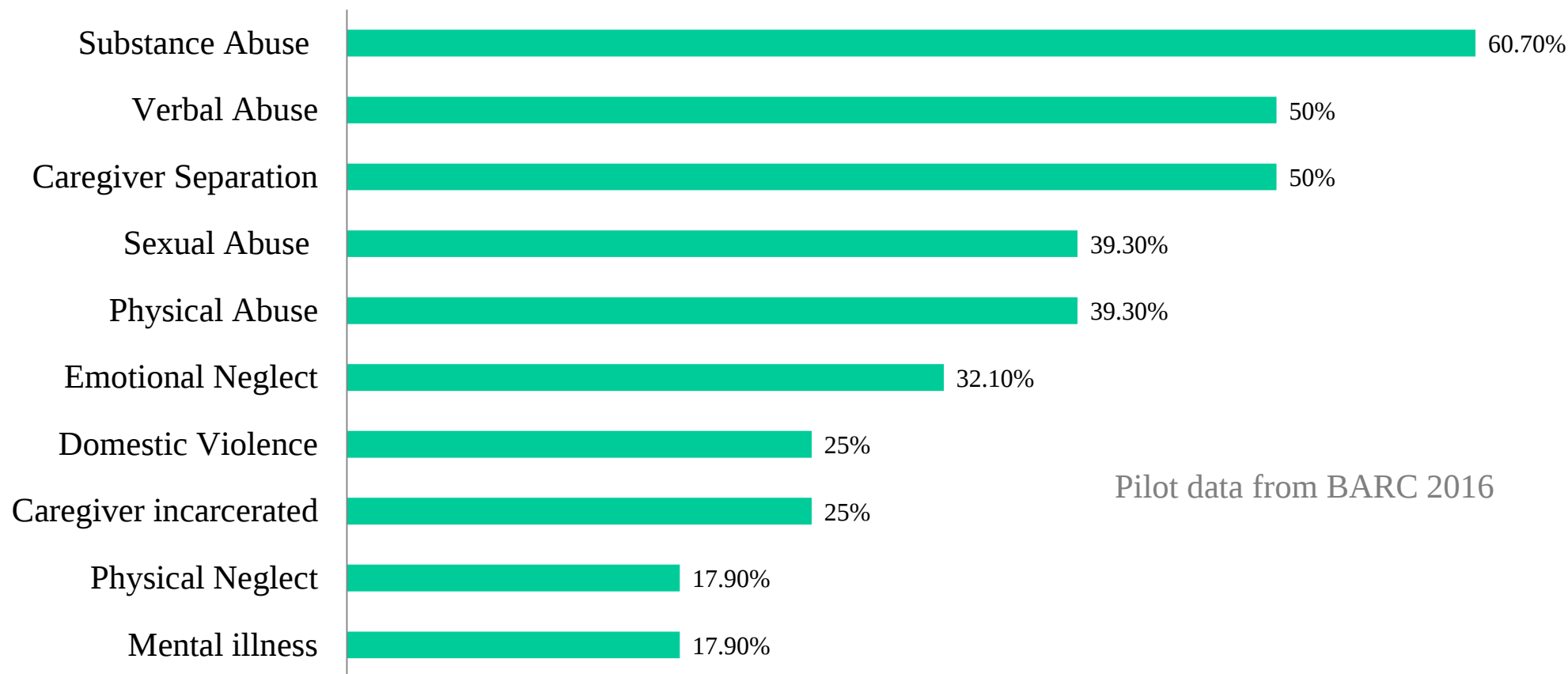
PEdiatric ACEs Screening and Resiliency Study (PEARLS)

- ✓ Prospective Screening Tool
- ✓ Biomarkers and Clinical Diagnoses
- ✓ Clinical interventions



Percentage of Adult Caregiver ACEs at UCSF BCHO

- 92.2% of Caregivers endorsed 1 or more (from list of 10)
- 46.3% endorsed 4 or more (from list of 10)



Pilot data from BARC 2016

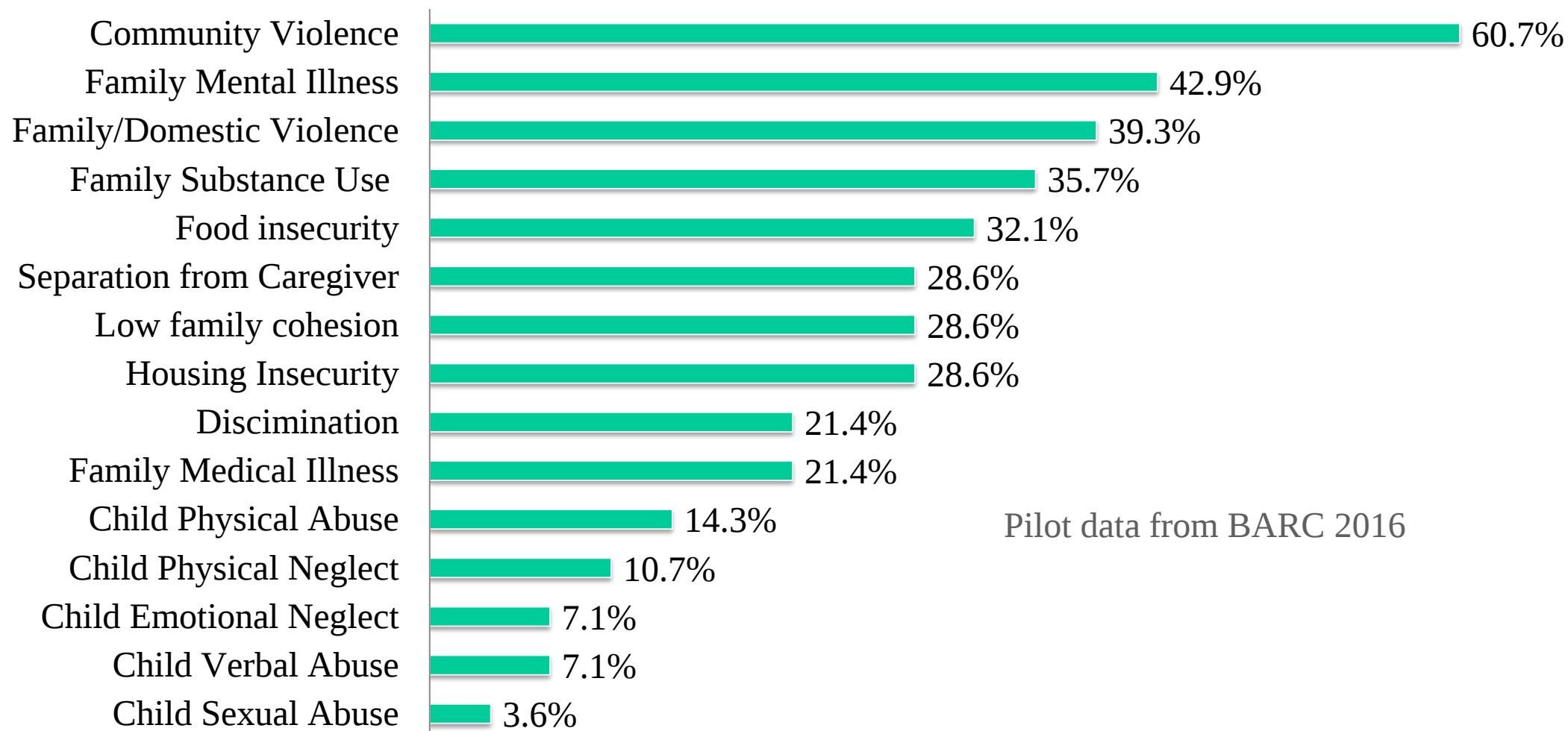
Original ACE Study Vs. Oakland Clinic Caregivers: ACEs Frequency

Types of ACEs	ACEs Study	FIT Pilot
Psychological abuse	11.10%	50%
Physical abuse	10.80%	39.28%
Sexual abuse	22%	39.28%
Substance abuse	25.60%	60.71%
Mental illness	18.80%	17.85%
Mother treated violently	12.50%	25%
Criminal behavior in the household	3.40%	25%

Pilot data from BARC 2016

Percentage of Child ACEs at UCSF BCHO

- 82.1% of Caregivers endorsed 1 or more (from list of 15)
- 53.6% endorsed 4 or more (from list of 15)





Positive stress

Brief increases in heart rate
Mild elevations in stress hormones

Tolerable stress

Serious, *temporary* stress
responses
Buffered by supportive
relationships

Toxic stress

Prolonged stress response
activation
Absence of protective relationships

Stressors

Trauma, Access, Demographics

Violence, Neighborhood
deprivation, Air pollution

Nature of stressor



Positive stress

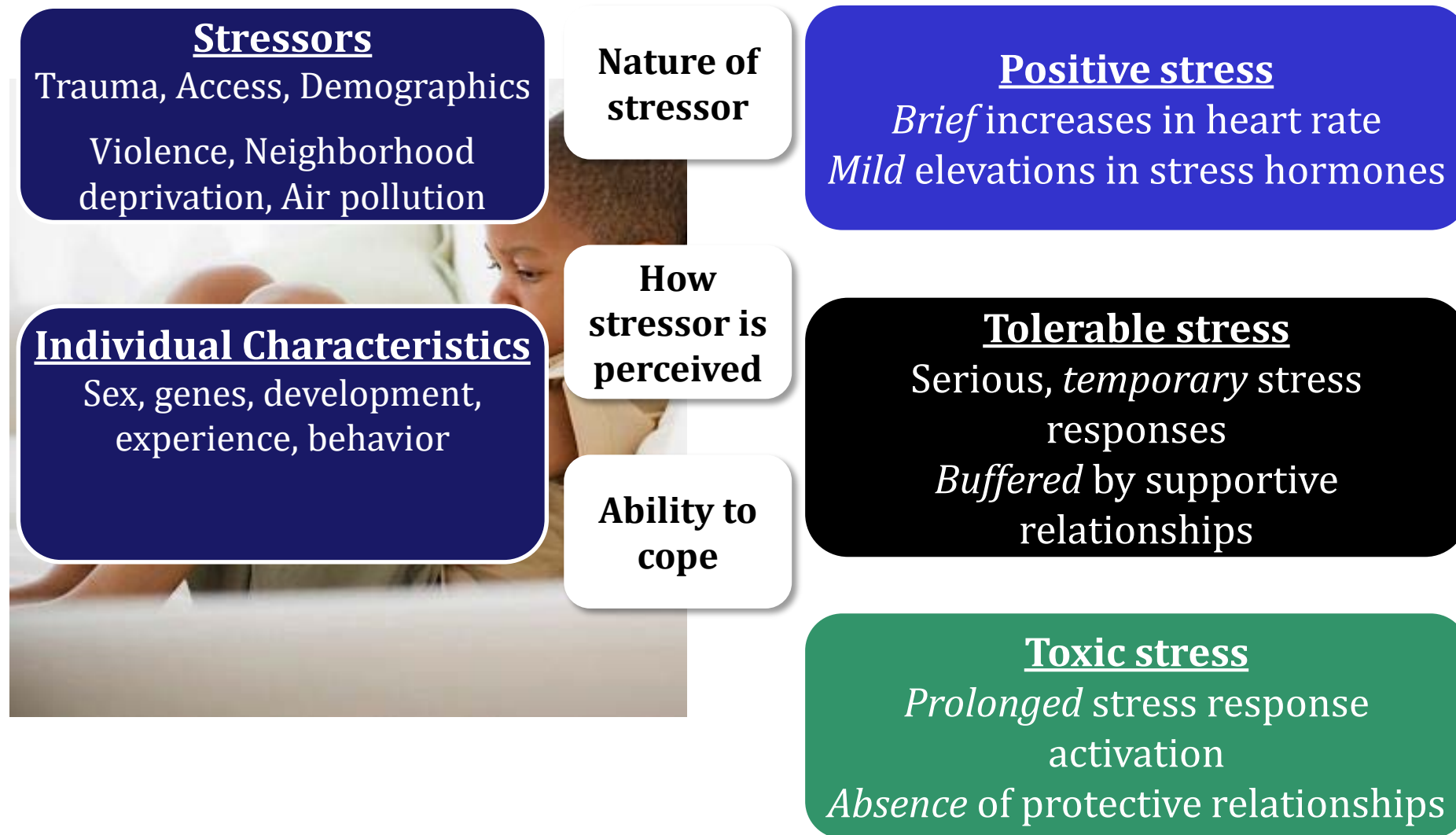
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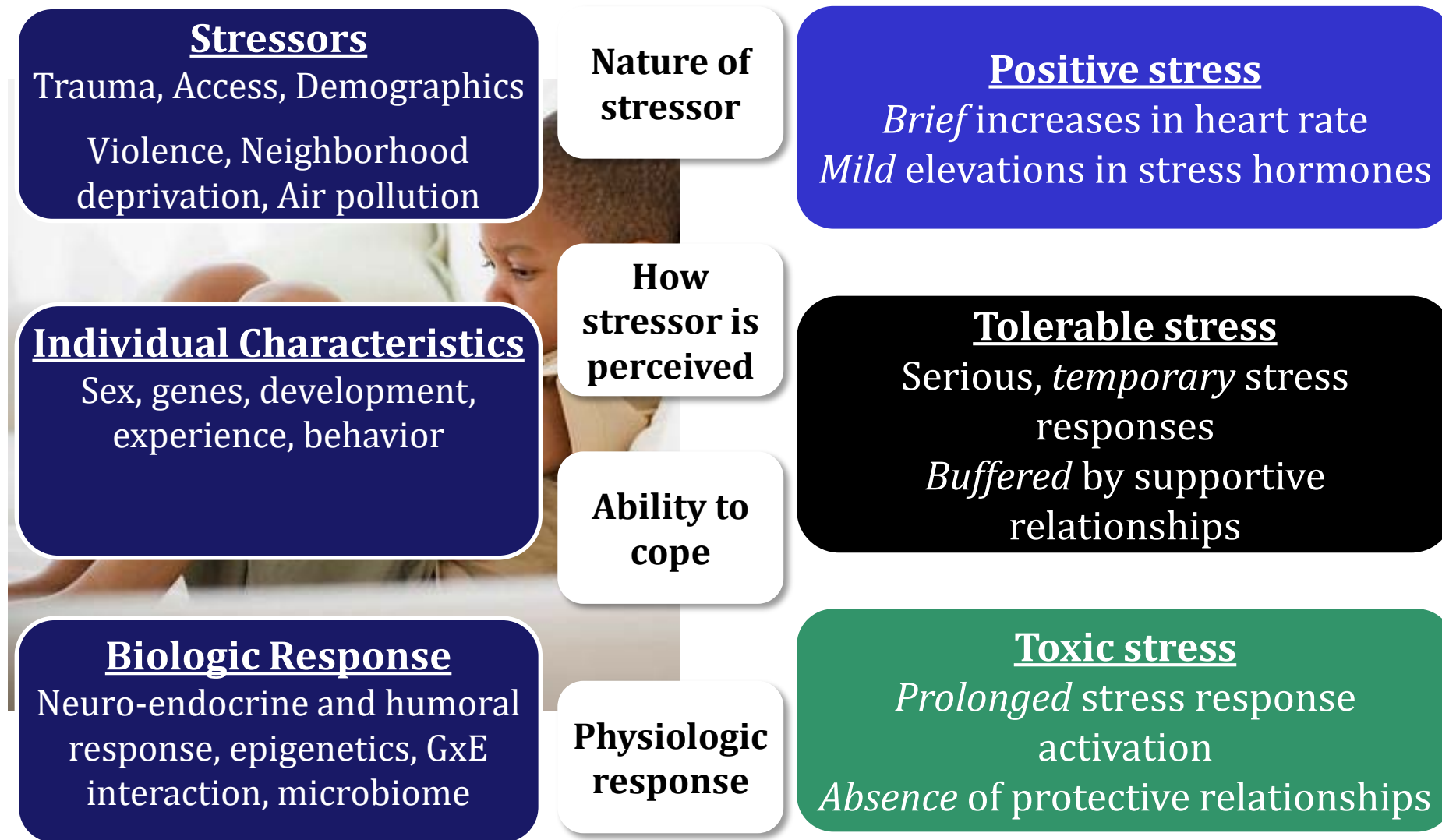
Tolerable stress

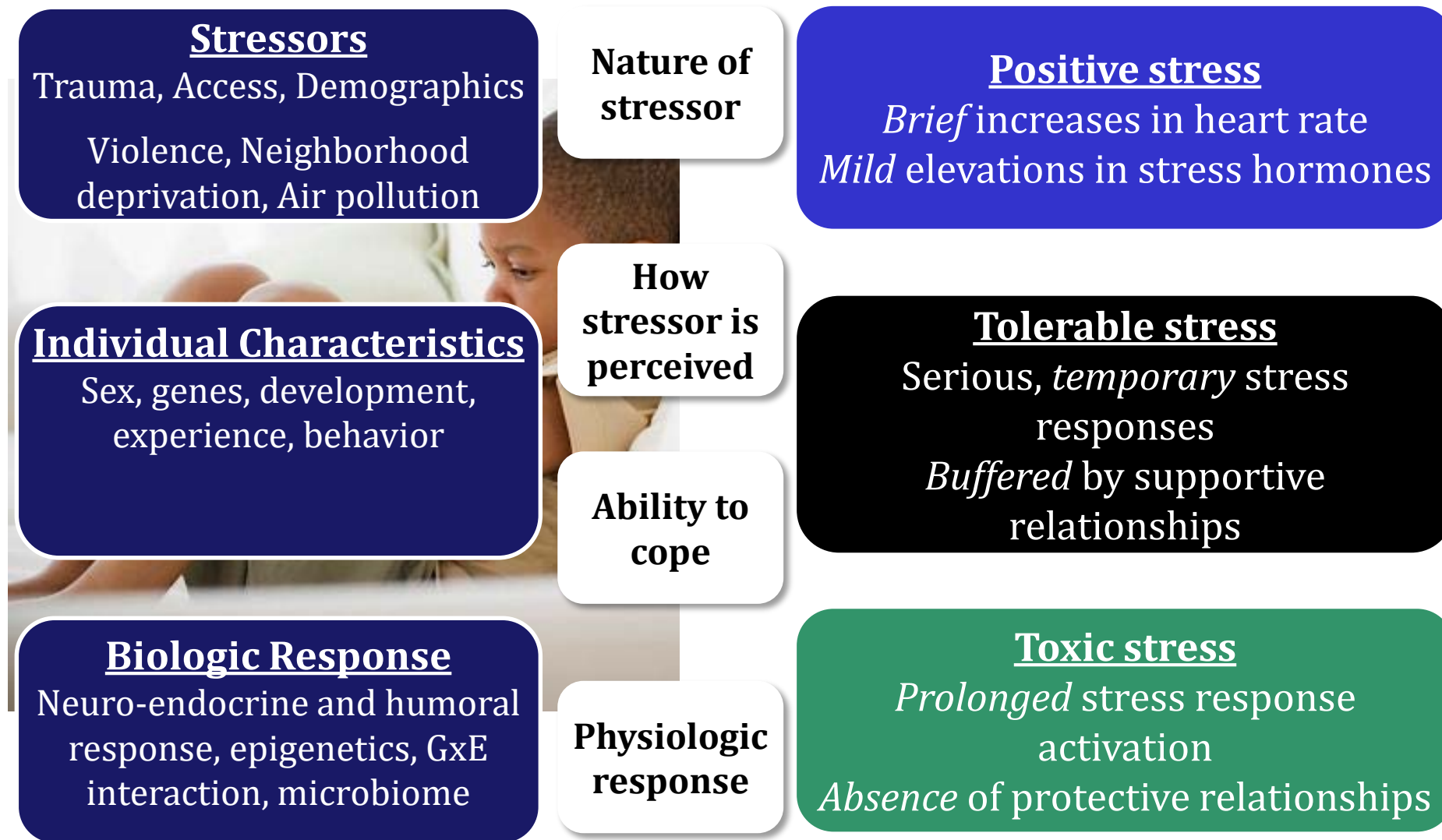
Serious, *temporary* stress
responses
Buffered by supportive
relationships

Toxic stress

Prolonged stress response
activation
Absence of protective relationships







A 3D rendering of a DNA double helix structure, colored in shades of blue and purple, winding across the frame. The background is a solid teal color.

How do ACEs get under our skin?

Biomarkers

Biomarkers of Stress being investigated

Biomarkers of Stress Across Systems of the Body	
Cardiovascular	<u>Physiologic</u> : Blood pressure, resting heart rate <u>Biomarker</u> : <i>Myeloperoxidase, endothelin-1, VEGF-A</i>
Metabolic	<u>Physiologic</u> : Waist-hip circumference, BMI <u>Biomarker</u> : Lipids, HA1C, <i>leptin</i>
Neuroendocrine	<u>Biomarker</u> : <i>brain-derived neurotrophic factor</i>
Inflammatory	<u>Biomarker</u> : <i>Cytokines, CRP, fibrinogen, white count</i>
Genetic	<u>Biomarker</u> : Telomere length, microbiome, DNA methylation, RNA expression (future study)

Developed by Dr. Neeta Thukar for BARC

The Health Outcomes of DOH+ ACES Over the Life Course



-
- Growth delay
 - Cognitive delay
 - Sleep disruption



-
- Asthma
 - Infection
 - Learning difficulties
 - Behavioral problems



-
- Obesity
 - Violence
 - Bullying
 - Smoking
 - Teen pregnancy





Clinical Signs and Symptoms

☐ Abdominal Pain

☐ ADHD

☐ Allergies

☐ Anemia

☐ Anxiety

☐ Asthma

☐ Constipation

☐ Failure to Thrive

☐ Excessive Crying

☐ Headache/Migraine

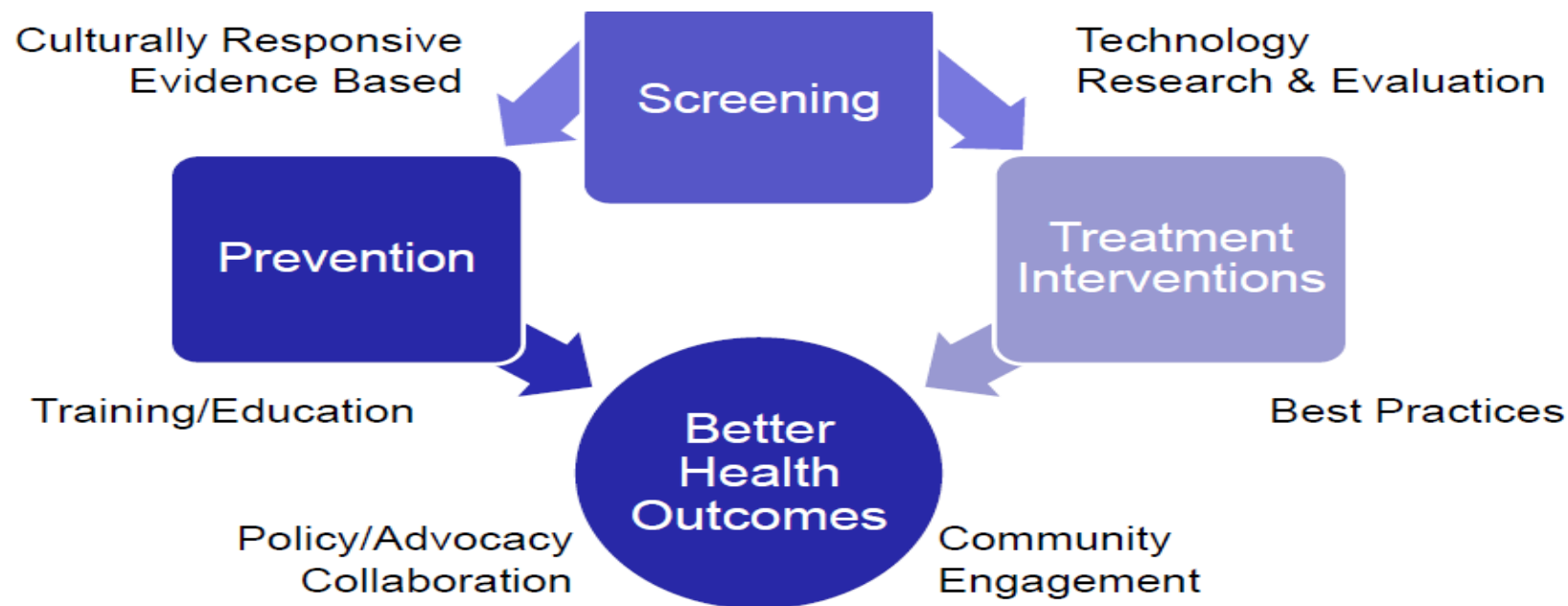
☐ Hypervigilance

☐ Learning issues

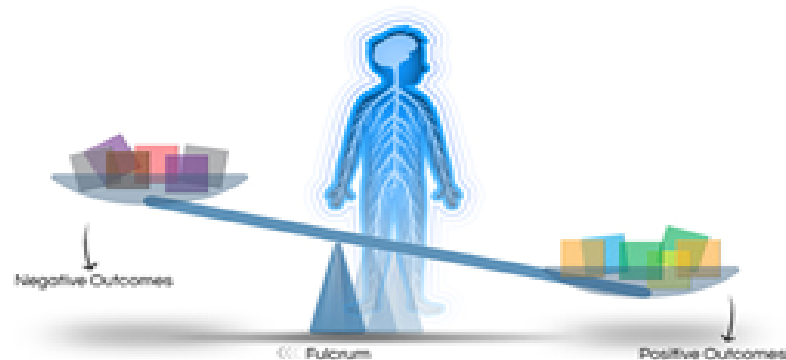
☐ Obesity

☐ Sleep Disorder

Pediatric Primary Care Clinical Interventions



Resilience



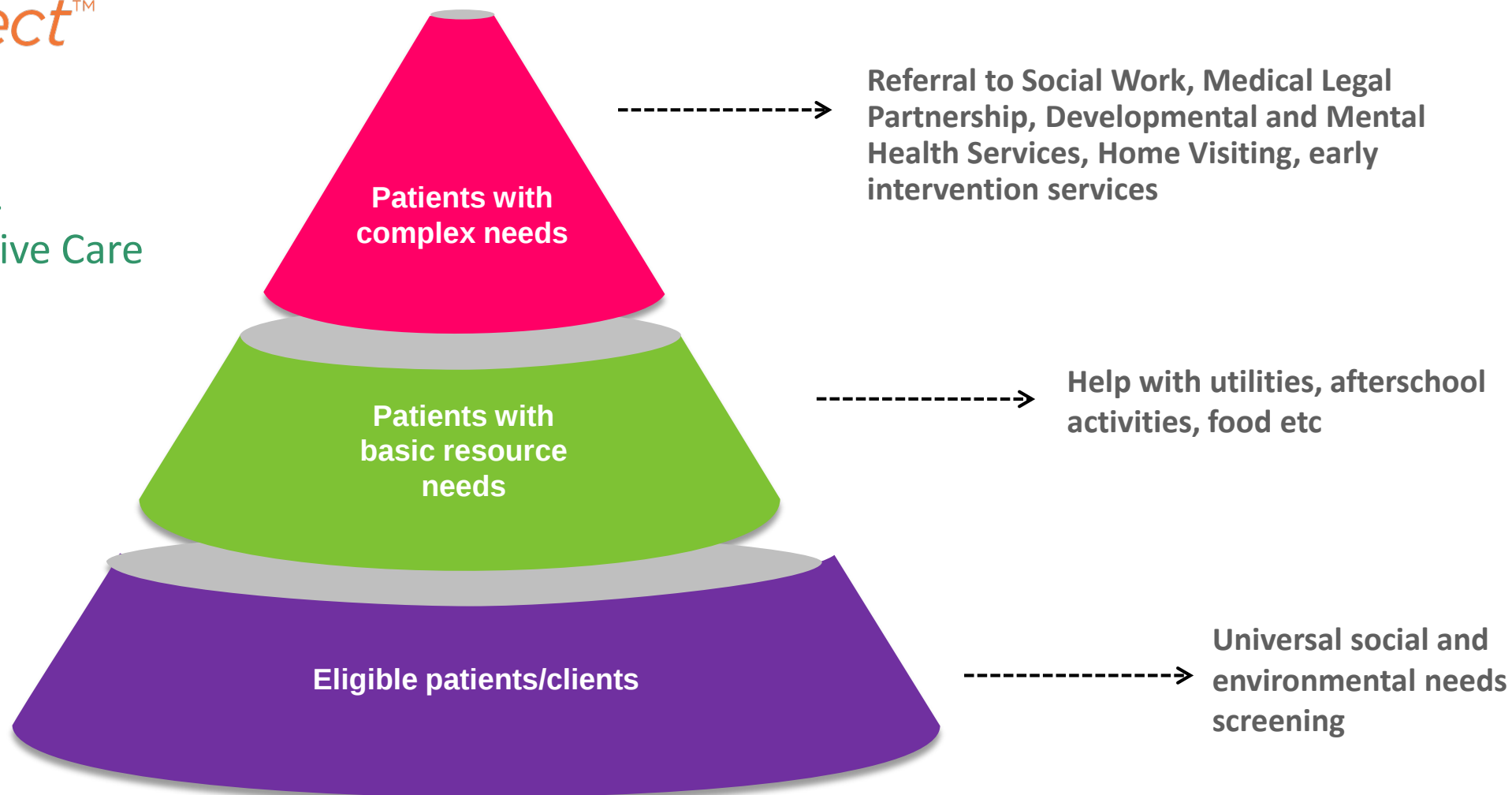
“In the final analysis, resilience is rooted in both the physiology of adaptation and the experiences we provide for children that either promote or limit its development.” -Jack Shonkoff, Harvard Center for the Developing Child

J. Shonkoff et al. Supportive Relationships and Active Skill-Building Strengthen the Foundations of Resilience. Working Paper 12.



Warm Hand-offs &
Culturally Responsive Care

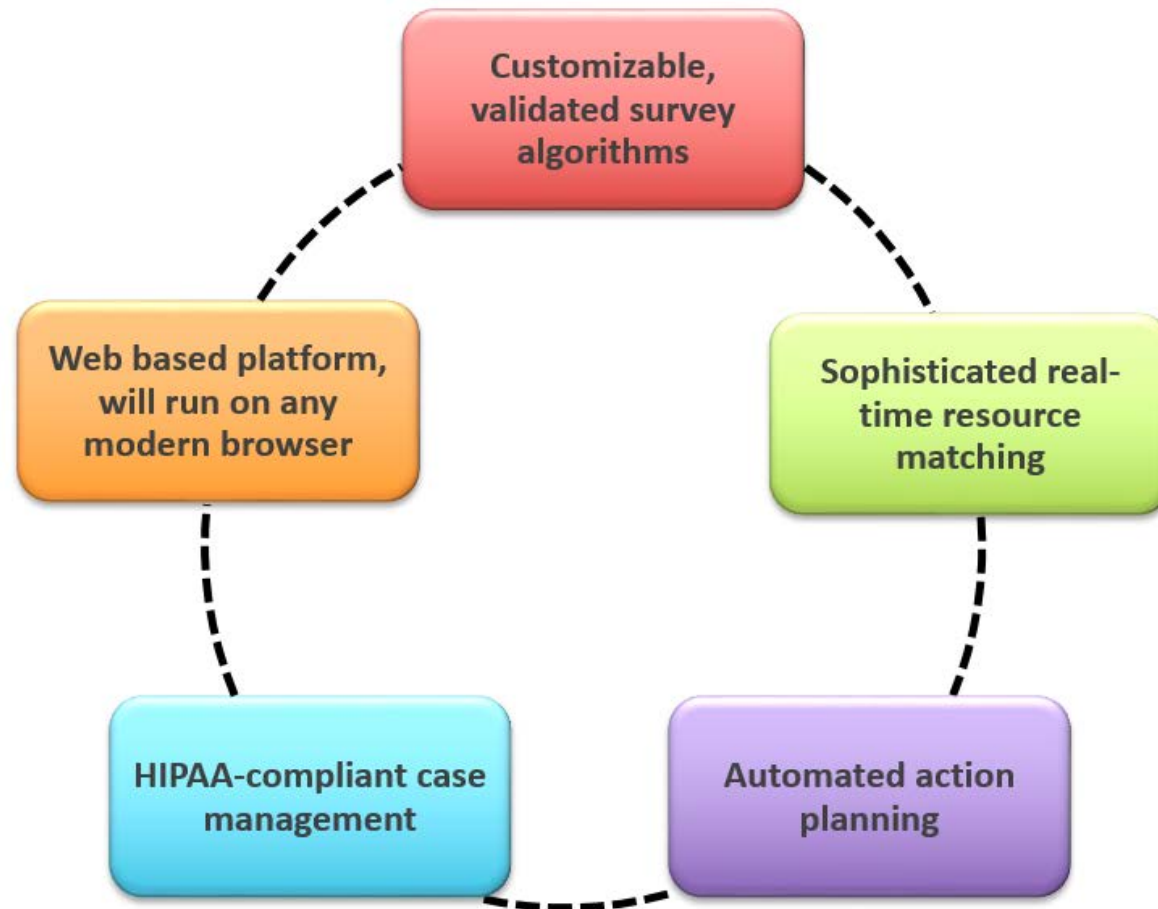
Adapted from Dr. Laura Gottlieb





A cloud based innovative solution that empowers patients, care teams and their communities to collaboratively address social determinants of health

FIND*connect* FEATURES



FINDconnect GOALS

To make connecting with resources for social and environmental determinants of health incredibly easy and effective for all

Suite of Tools

- **Opportunity Assessment**
- **Action Plan creation and delivery**
- **Knowledge Base**
- **Case Management**

Automation provides

- **Scalability**
- **Outcome tracking**
- **Program quality and evaluation**

Training & Education

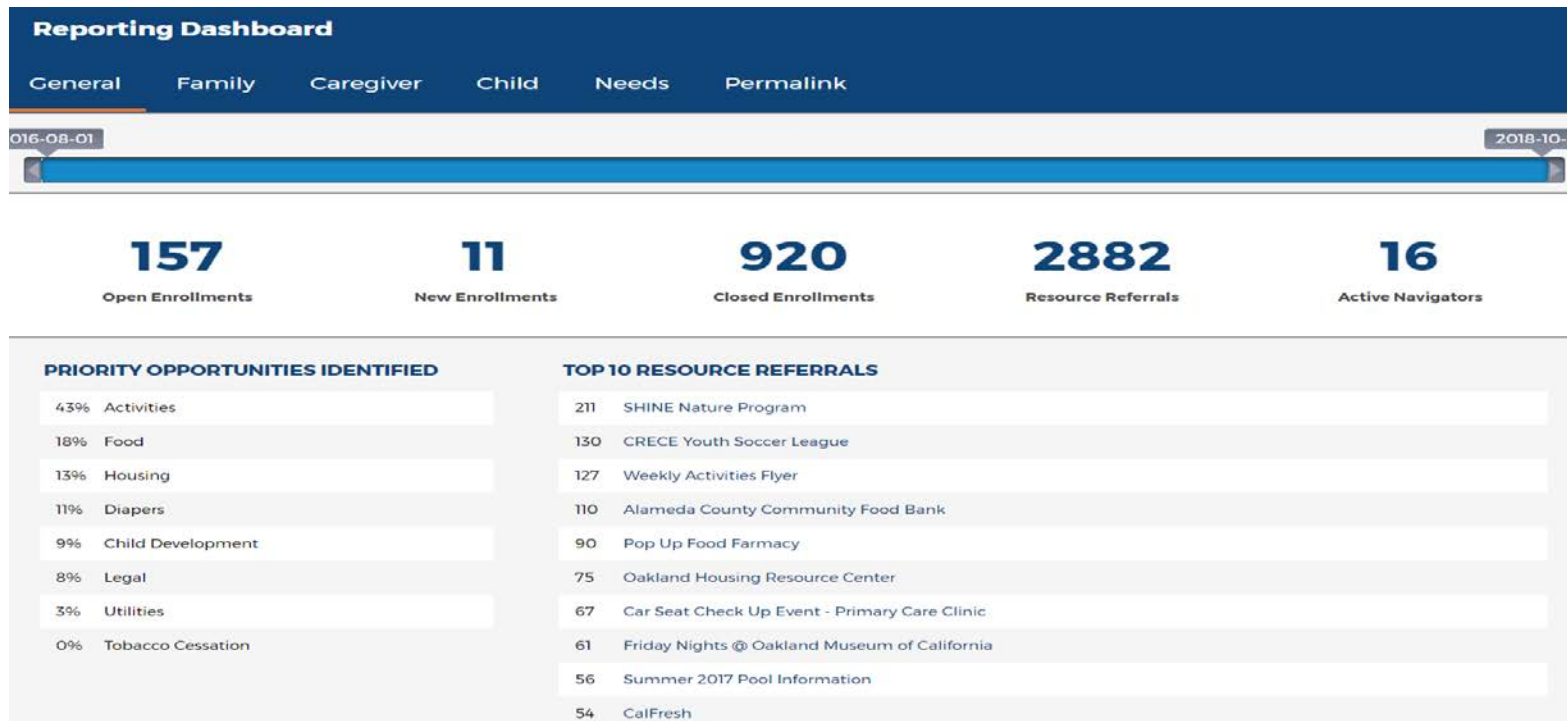
- **Integrating into clinic flow**
- **User guide**
- **Cultural Humility/Trauma Informed platformed**

Navigators

- Facilitate the trusted relationship
- Central part of medical team
- Diverse workforce mirrors the community
- Enable all staff to work at the top of their license
- Use technology as a tool to increase efficacy and capacity

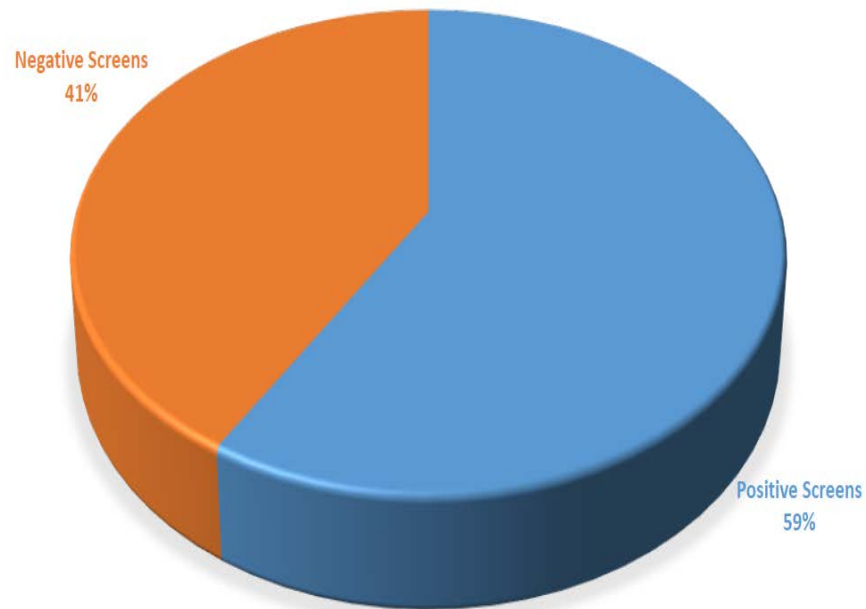


FINDconnect: Population Level Data



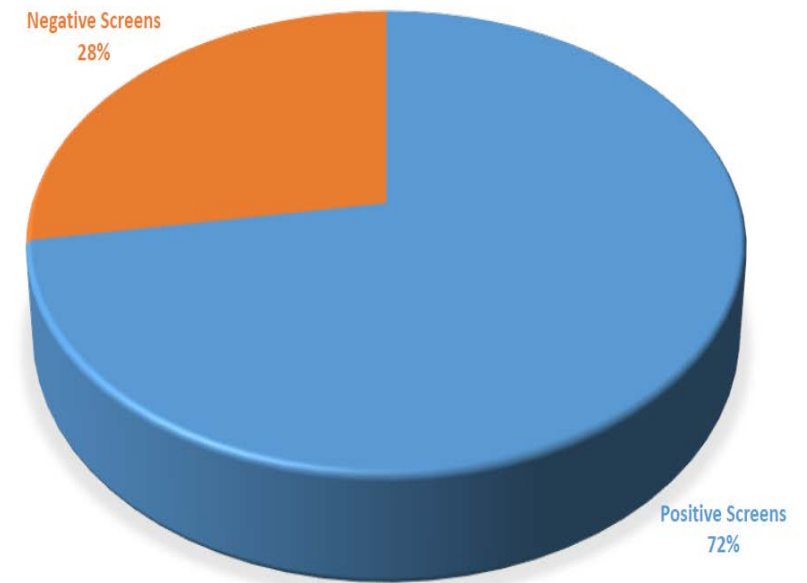
Mental Health Care Coordination

Adult



Original data FINDconnect copyright 2017

Child

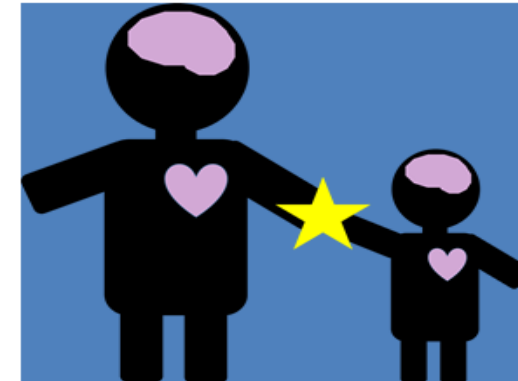


Original data FINDconnect copyright 2017

Resiliency Clinics



The Resiliency Clinic Workbook



Sponsored by the Bay Area Research Consortium/ Authored by Rachel Gilgoff, MD, and Karen Deley, MA, MFT

Food As Medicine



Free fresh fruits,
vegetables, whole grains
and more for Children's families

UCSF Benioff Children's Hospital
Oakland



FOOD FARMACY

FREE Pop Up Market

2nd Thursday of the Month 11:30-1:30 in the Courtyard behind the hospital	4th Thursday of the Month 10:30-12:30 at Primary Care 5275 Claremont Ave
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Please come early as we sometimes run out of food!

A collaboration between UCSF Benioff Children's Hospital's Center for Community Health and Engagement, Primary Care Clinic, and Medical Social Services Department, along with Alameda County Community Food Bank and Phat Beets Produce

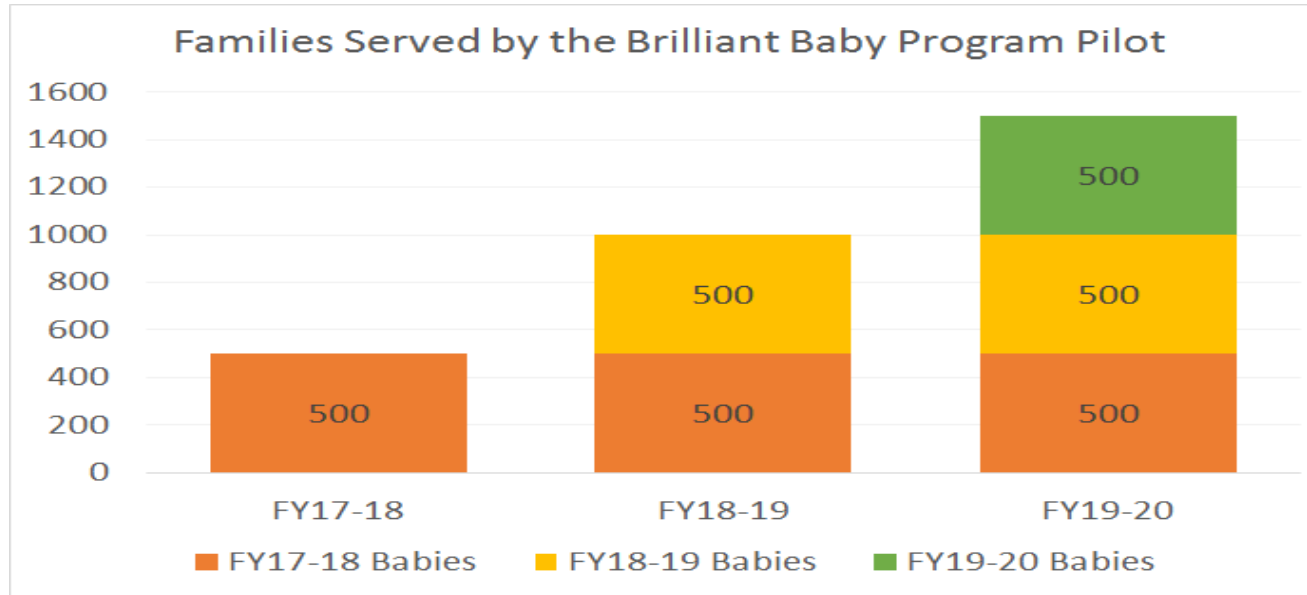


ALAMEDA COUNTY
COMMUNITY
FOOD BANK



Brilliant Baby Program

3 year Demonstration with 1500 Babies



Research Study in partnership with UCSF Children's Hospital Oakland and the University of Chicago.
Follow for 25 years.

At Scale: All 2200 babies born to MediCal eligible families in Oakland each year.

The Vision for the Future

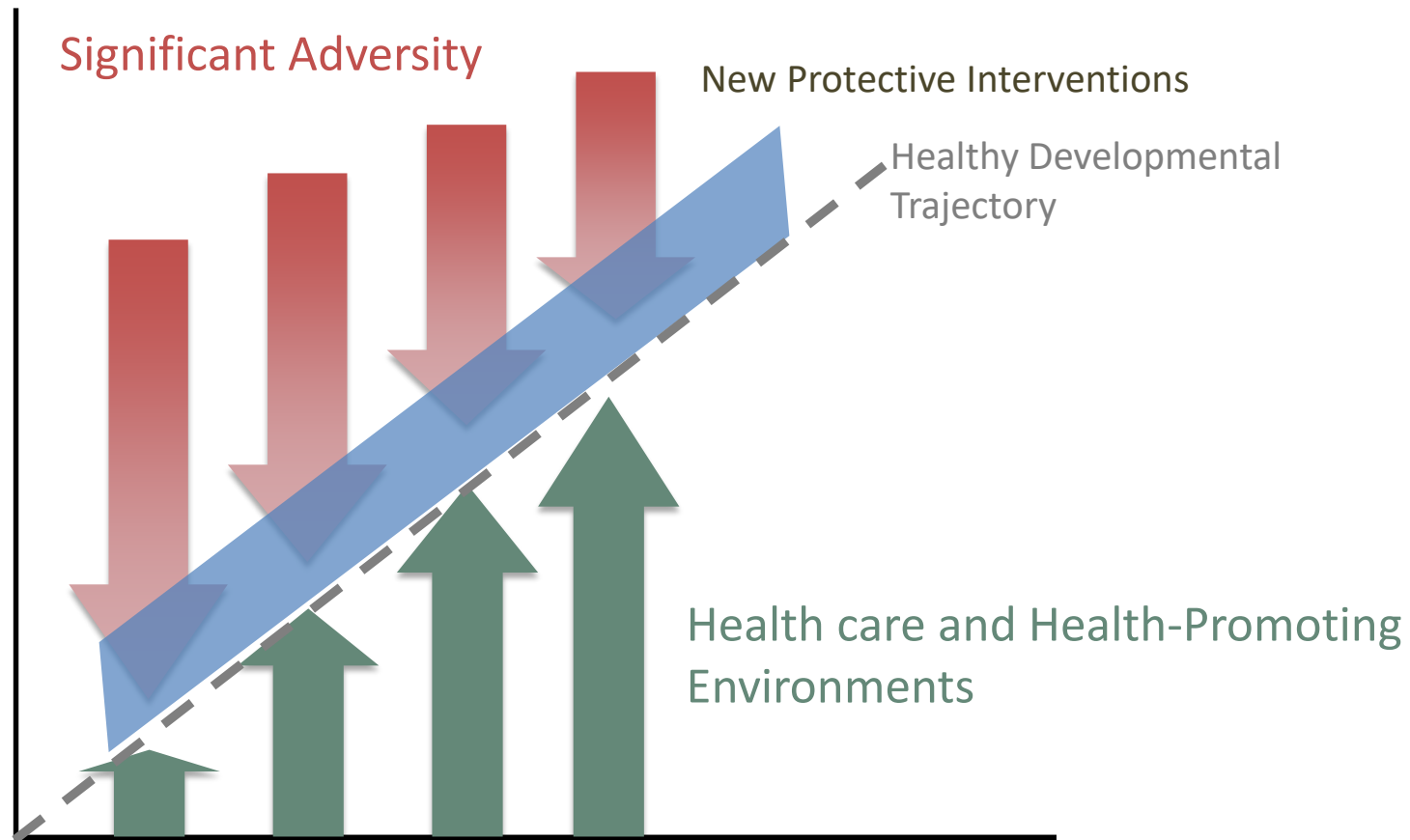
- Sustainable Practice re-design for Primary Care Pediatrics to support dyads of children and caregivers
- National Practice Guidelines
- Local, State and Federal Policy Formation
- Collaborative Multi-Sector Partnerships
- Hub of Research Innovation

Lessons Learned

- ☐ Understanding the impact that determinants of health and trauma has on health
- ☐ Effective population health requires universal screening and data management capability that does not exist yet but is developing
- ☐ Develop partnerships, both internal and external, make sure that roles and responsibilities are clear
- ☐ Eliminate silos
- ☐ Involve the target population early; listen closely
- ☐ Allow the process to be iterative
- ☐ Consider sustainability in design

**Sometimes,
it takes a
good fall to
really know
where you
stand.**

North Star: Innovation has the potential to disrupt the link between adversity and poor health





“Of all the forms of inequality, injustice in health care is the most shocking and inhumane.”