

# Early Childhood in Alaska

## What the Data & Research Tell Us



Presentation to the Alaska House of Representative's  
Health and Social Services Committee, March 14, 2018

# AECCC Alaska Early Childhood Coordinating Council



# Questions

**At what age are children in the U.S. most likely to be expelled from school?**

**What percentage of Alaskan children age 6 and under receive care by someone other than their parent or guardian?**

**By age eight, what percentage of Alaskan children have had a first report of harm made to OCS?**

**What percentage of Alaskan children at the start of Kindergarten regulate their feelings and impulses?**

**What skills can mitigate the health impact of toxic levels of stress in childhood?**

# Outline- What the Research Tells Us

## 1) The Importance of Early Childhood

- 1) Heckman Equation
- 2) The Brain Science

## 2) The Data

- 1) Population
- 2) Sources of Information
- 3) Prenatal
- 4) Birth and Infancy
- 5) Pre-School Age
- 6) School Age

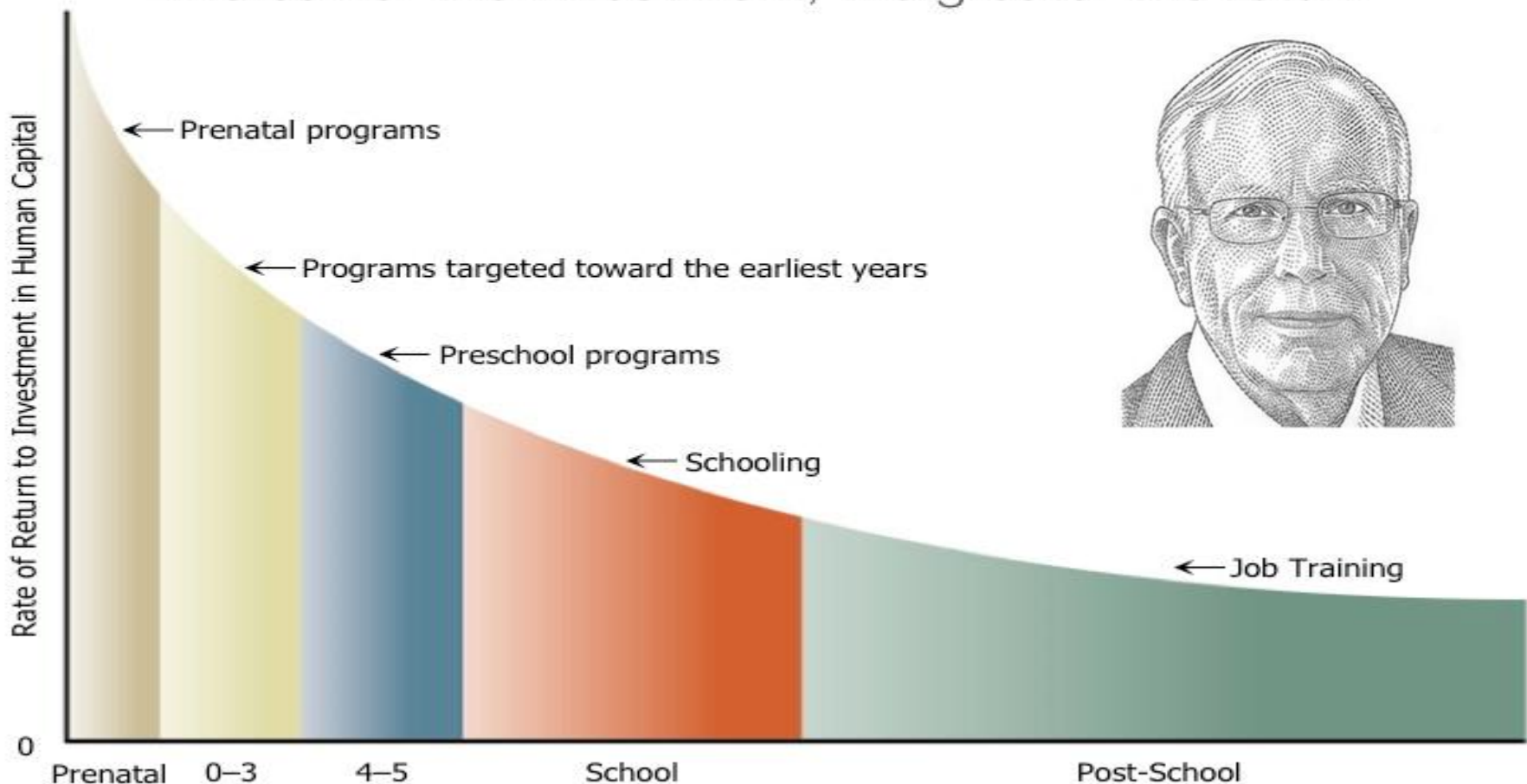


## 3) Analysis

1. What Hurts
2. What Works

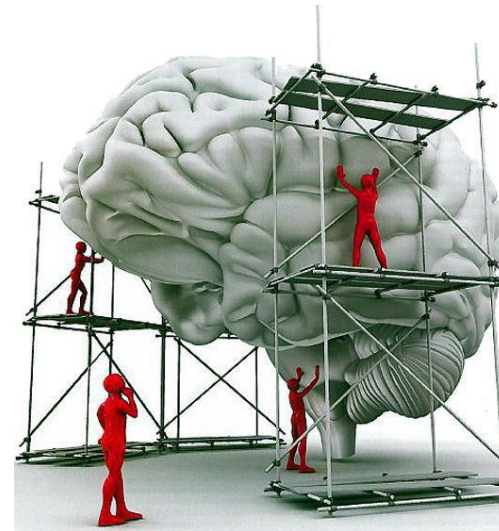
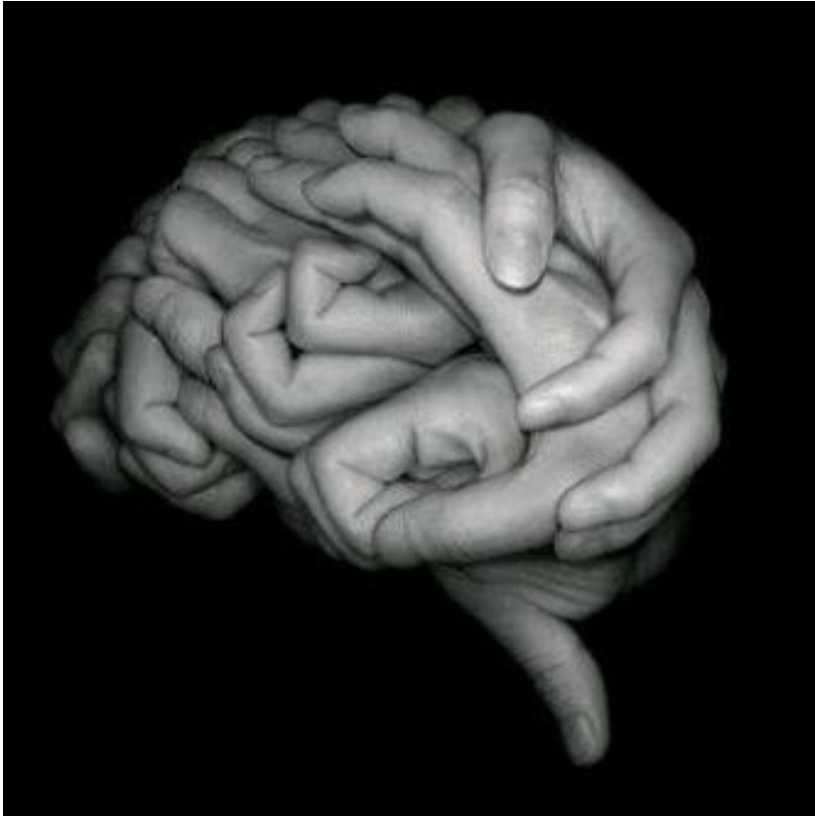
# EARLY CHILDHOOD DEVELOPMENT IS A SMART INVESTMENT

The earlier the investment, the greater the return



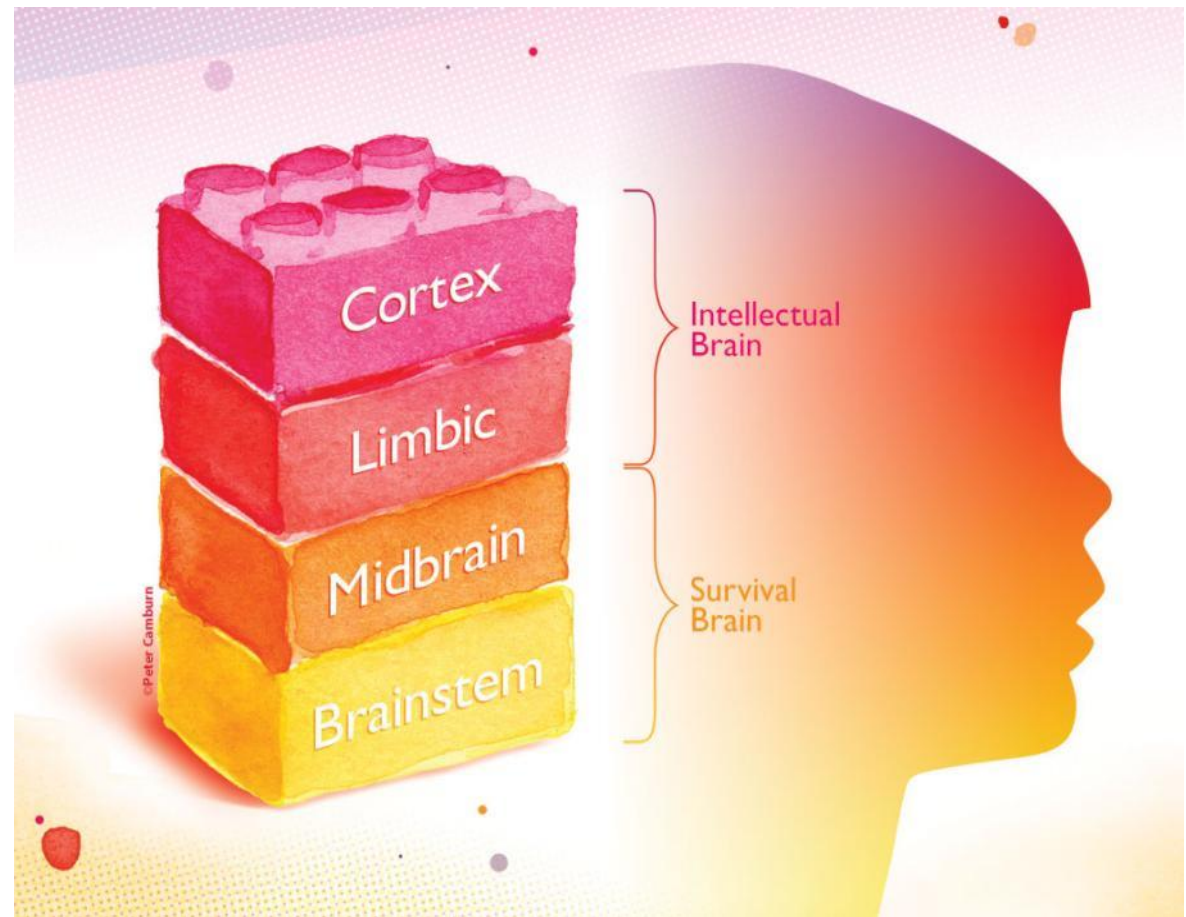
Source: James Heckman, Nobel Laureate in Economics

# The Brain



# Building Blocks of the Brain

Abstract thought  
Planning for future  
Decision-making  
Self-awareness & insight  
Balancing emotions  
Empathy  
Memory  
Attention  
Emotions  
Motor Regulation  
Sleep  
Digestion  
“Staying alive” →  
respiration, heart rate...



Peter Camburn

# Wired Up – Wired Down



At a Child's Birth




at 7 Years Old



at 15 Years of Age





“Self-control, openness, the ability to engage with others, to plan and to persist – these are the attributes that get people in the door and on the job and lead to productive lives.”



**James Heckman**  
Nobel Laureate in Economics



# SEVEN KEY PRINCIPLES OF SELF-REGULATION

## SELF-REGULATION:

- serves as the foundation for lifelong functioning
- is defined from an applied perspective as the act of managing cognition and emotion
- enactment is influenced by a combination of individual and external factors
- can be strengthened and taught
- is dependent on “co-regulation” provided by parents or other caregiving adults
- can be disrupted by prolonged or pronounced stress and adversity including poverty and trauma experiences
- develops over an extended period from birth through young adulthood and beyond

Murray, Desiree W., Rosanbalm, Katie, Christopoulos, Christina, and Hamoudi, Amar (2015). **Self-Regulation and Toxic Stress: Foundations for Understanding Self- Regulation from an Applied Developmental Perspective.** OPRE Report #2015-21, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

# How Many Alaskans Aged Eight and Under\*

## Ages Birth through 8

Number of Alaskans

**95,669**

Percentage of Population

**13.0%**

## How Does it Compare

### Ages 65 Plus

Number of Alaskans

**82,686**

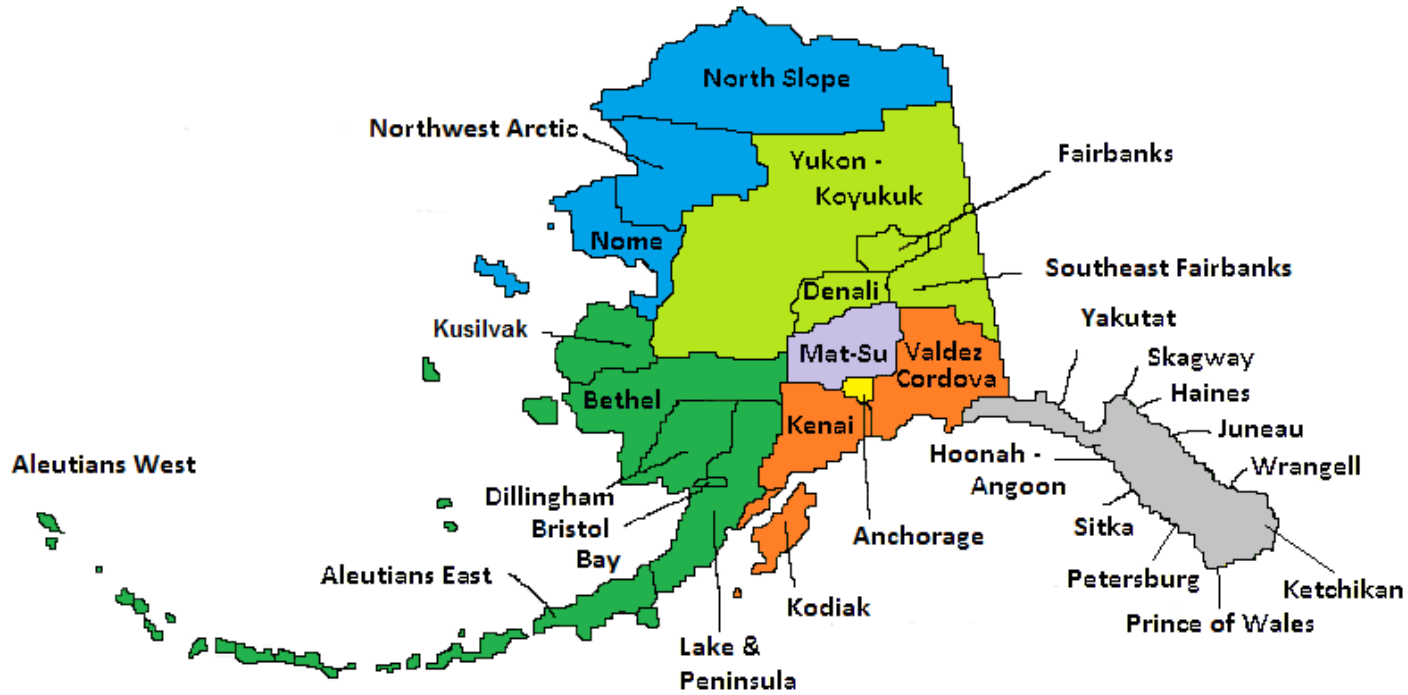
Percentage of Population

**11.2%**

\***Sources:** Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Census Bureau, July 2017 Estimates

Department of Labor and Workforce Development  
**Research and Analysis**

# Birth to Age Nine

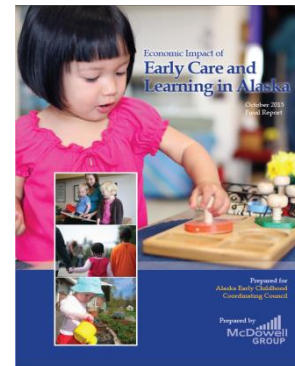


\*Sources: Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Census Bureau, July 2017 Estimates

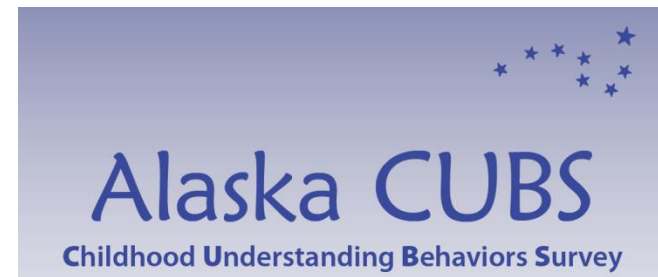
Calculations by Alaska Mental Health Board Staff



# Key Data Sources



# Searchable Data Sources





































## ☰ Before Pregnancy

- ☰ [Preconception: Dieting](#)
- ☰ [Preconception: Exercise 3+ days/week](#)
- ☰ [Preconception: Taking Medicines](#)
- ☰ [Preconception: Diabetes checked for or treated](#)
- ☰ [Preconception: High blood pressure](#)
- ☰ [Preconception: Depression or anxiety](#)
- ☰ [Preconception: Family medical history](#)
- ☰ [Preconception: Teeth Cleaned](#)
- ☰ [Multivitamin use 1 month before pregnancy](#)
- ☰ [Pre-pregnancy body mass index \(BMI\)](#)
- ☰ [Diabetes \(type 1 or type 2\)](#)
- ☰ [Pregnancy intention](#)
- ☰ [Live births despite use of birth control](#)
- ☰ [Problems getting birth control 12 months before pregnancy](#)
- ☰ [Smoked 3 months before pregnancy](#)
- ☰ [Drank 3 months before pregnancy](#)
- ☰ [Binge drinker \(4 drinks+ in a 2-hour time span\) 3 months before pregnancy](#)
- ☰ [Marijuana use 12 months before pregnancy](#)
- ☰ [Physical abuse 12 months before pregnancy](#)
- ☰ [Controlling partner \(emotional abuse\) 12 months before pregnancy](#)
- ☰ [Called the police because you felt threatened 12 months before pregnancy](#)



## During pregnancy

-  [Prenatal care started in the first trimester \(self report\)](#)
-  [Prenatal care as early as wanted](#)
-  [Prenatal care: Weight gain counseling](#)
-  [Prenatal care: Affects of smoking counseling](#)
-  [Prenatal care: Breastfeeding counseling](#)
-  [Prenatal care: Affects of drinking counseling](#)
-  [Prenatal care: Seat belt counseling](#)
-  [Prenatal care: Medicines that are safe counseling](#)
-  [Prenatal care: Illegal drugs counseling](#)
-  [Prenatal care: Birth defects counseling](#)
-  [Prenatal care: Signs of preterm labor counseling](#)
-  [Prenatal care: Preterm labor counseling](#)
-  [Prenatal care: HIV testing counseling](#)
-  [Prenatal care: Depression counseling](#)
-  [Prenatal care: Physical abuse counseling](#)
-  [Prenatal care: Advised not to drink](#)
-  [HIV test during pregnancy](#)
-  [Knowledge of folic acid benefits](#)
-  [WIC during pregnancy](#)
-  [Gestational diabetes](#)
-  [Labor induction \(self-report\)](#)
-  [Rules about smoking inside the home during pregnancy](#)
-  [Smoked last 3 months of pregnancy](#)
-  [Drank last 3 months of pregnancy](#)
-  [Binge drinker \(4 drinks+ in a 2-hour time span\) last 3 months of pregnancy](#)
-  [Marijuana use during pregnancy](#)
-  [Spit tobacco use \(chew, iqmik\) during pregnancy](#)
-  [Physical abuse during pregnancy](#)
-  [Controlling partner \(emotional abuse\) during pregnancy](#)
-  [Teeth cleaned during pregnancy](#)
-  [Partner-associated stress 12 months before delivery](#)
-  [Financial stress 12 months before delivery](#)
-  [Emotional stress 12 months before delivery](#)
-  [Traumatic stress 12 months before delivery](#)





## ☰ After pregnancy

- ☰ [Postpartum birth control -- using now](#)
- ☰ [Postpartum depressive symptoms](#)
- ☰ [Postpartum discussion: Breastfeeding](#)
- ☰ [Postpartum discussion: Birth spacing](#)
- ☰ [Postpartum discussion: Birth control](#)
- ☰ [Postpartum discussion: Depression](#)
- ☰ [Postpartum discussion: Support groups](#)
- ☰ [Postpartum discussion: Community resources](#)
- ☰ [Postpartum discussion: Healthy weight](#)
- ☰ [Rules about smoking inside the home now](#)
- ☰ [Smoke now](#)
- ☰ [Planning to quit smoking](#)
- ☰ [Marijuana use since new baby was born](#)
- ☰ [Controlling partner \(emotional abuse\) since your new baby was born](#)

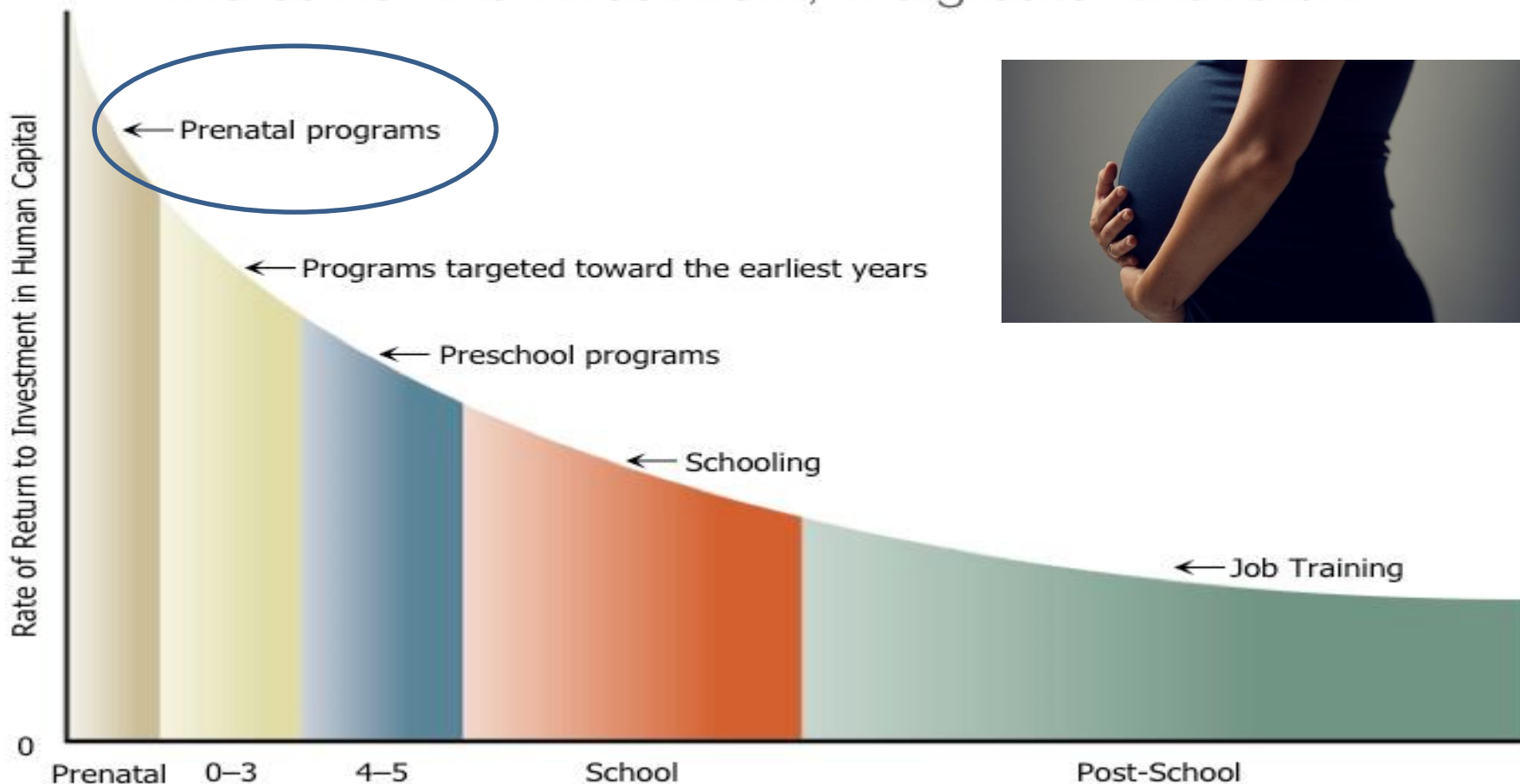
## ☰ Infant

- ☰ [Mode of delivery \(self-report\)](#)
- ☰ [Infant in ICU at birth](#)
- ☰ [Baby nights in hospital](#)
- ☰ [Infant one week check-up](#)
- ☰ [Ever breastfed](#)
- ☰ [Still breastfeeding](#)
- ☰ [Breastfeeding at 1 month](#)
- ☰ [Breastfeeding at 2 months](#)
- ☰ [Infant sleep position](#)
- ☰ [Sleeps in a crib, usually](#)
- ☰ [Sleeps on a firm mattress, usually](#)
- ☰ [Sleeps with pillows, usually](#)
- ☰ [Sleeps with bumper pads, usually](#)
- ☰ [Sleeps with plush blankets, usually](#)
- ☰ [Sleeps with stuffed toys, usually](#)
- ☰ [Sleeps with another person, usually](#)
- ☰ [Bed shared, last night](#)



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The earlier the investment, the greater the return



Source: James Heckman, Nobel Laureate in Economics

# Smoked During Last Three Months of Pregnancy

Query Results for Alaska's Pregnancy Risk Assessment and Monitoring Survey (PRAMS) Query Module - Smoked During Last 3 Months of Pregnancy

## Query Criteria

**Yes vs. No Response Filter:** Calculate percentage of "Yes" responses

**Data Grouped By:** Year

## Data Table

Year	Smoked Last 3 Months of Pregnancy	95%CI -LL-	95%CI -UL-	Number of Responses	Sample Size	Statistical Stability
2009	15.3%	13.1%	17.8%	228	1,217	-
2010	16.8%	14.2%	19.8%	216	1,133	-
2011	13.8%	11.7%	16.4%	204	1,138	-
2012	13.1%	10.9%	15.8%	156	895	-
2013	13.4%	11.4%	15.6%	223	1,296	-
2014	13.0%	10.9%	15.5%	188	1,195	-
<b>Overall</b>	<b>14.3%</b>	<b>13.3%</b>	<b>15.3%</b>	<b>1,215</b>	<b>6,874</b>	-

**13,680/ 95,669**



# Interpersonal Violence and Pregnancy

- During the 12 months before you got pregnant with your new baby, did your husband or partner push, hit, slap, kick, choke, or physically hurt you in any other way?
- During your most recent pregnancy, did you husband or partner push, hit, slap, kick, choke, or physically hurt you in any other way?
- During the 12 months before you got pregnant with your new baby, did you ever call the police because you felt threatened by your husband or partner? (Include calls to 911, AST, VPSO)
- During the 12 months before I got pregnant: your husband or partner threaten you, limit your activities against your will or make you feel unsafe in any other way?
- During my most recent pregnancy: your husband or partner threaten you, limit your activities against your will or make you feel unsafe in any other way?

**Yes to at least one - 7.6%**

**~7,270/95,669**



Based on 3 year sample 2009-2011,  
Jared Parrish, Ph.D

# The Mechanism of Change

## Epigenetics

- Compelling new science showing how nurture can affect nature
  - Molecular biological methods to change gene **expression** without changing the gene itself
  - Done by changing the chemical composition of regulatory segments of the gene
    - DNA methylation
    - Modification of histones



# Epigenetics Passed from Moms to Children

- Fetal exposure to maternal stress influences future stress responses in a negative way
  - Moms who are stressed (stressful event, increased anxiety, depression) during pregnancy are more likely to have kids with:
    - Preterm birth
    - Poor emotional coping skills
    - Decreased cognitive abilities
    - Increased fear response to stimuli
    - Increased anxiety
  - These effects are mediated by histone modification and DNA methylation

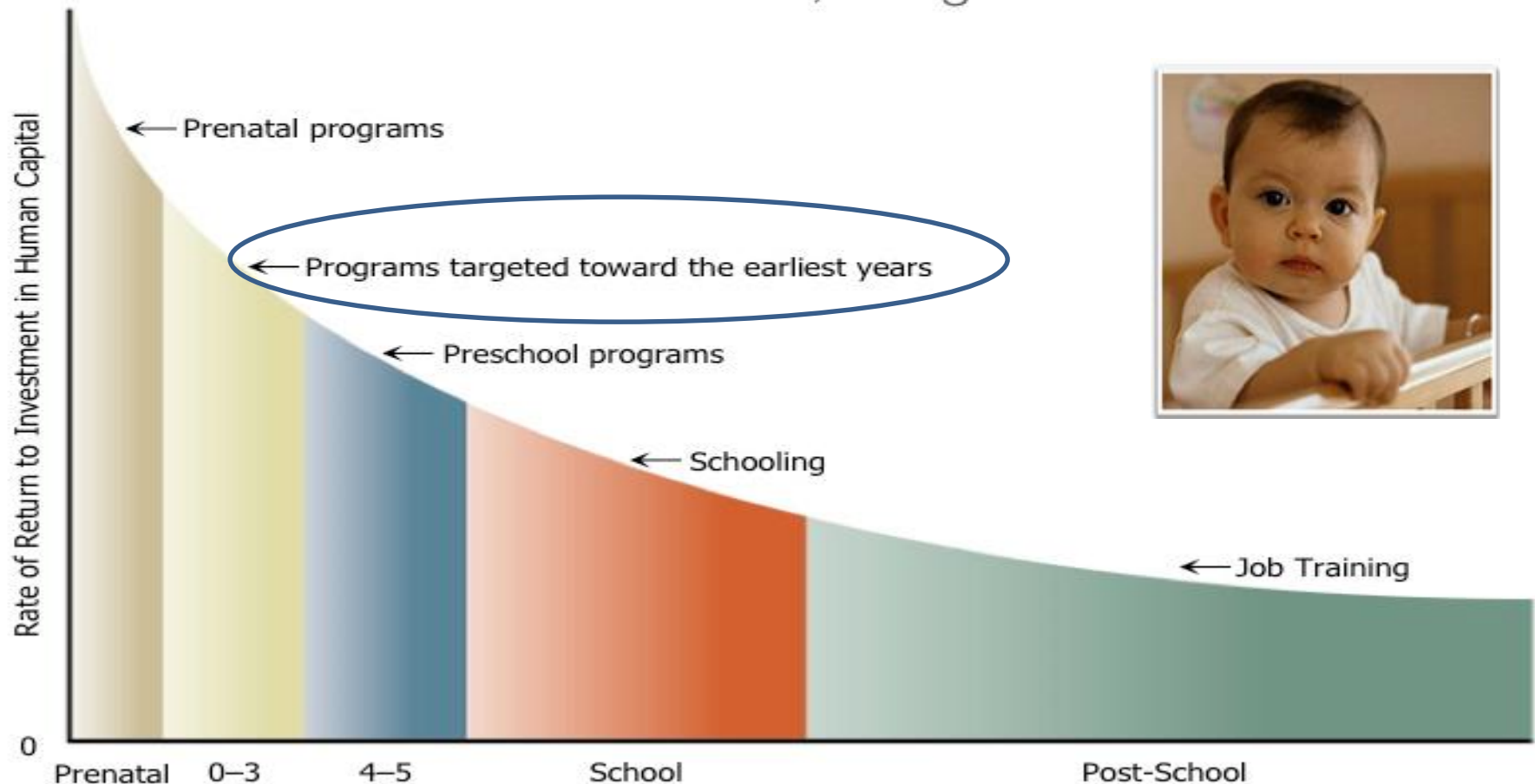
Slide Source: Matt Hirschfeld, M.D., Ph.D



ALL ALASKA  
PEDIATRIC  
PARTNERSHIP

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Source: James Heckman, Nobel Laureate in Economics

# Nutrition

**(Q5) The following statements are about breastfeeding or feeding pumped breast milk.** Please select the statement that best describes how you fed your child.

	%	95% CI*	
I never fed any breast milk to my child	<b>6.7</b>	4.1	10.9
I fed breast milk to my child for <i>less than 1 month</i>	<b>12.7</b>	9.3	16.9
I fed breast milk to my child for <i>1 month or more</i>	<b>80.6</b>	75.5	84.9

**(Q7d) Yesterday, about how many cups did your child have of SODA (do not include diet soda)?**

	%	95% CI*	
None	<b>82.8</b>	78.2	86.6
<1 Cup	<b>8.1</b>	5.6	11.7
1 Cup	<b>6.3</b>	4.0	9.7
2 Cups	<b>2.2</b>	1.0	4.7
3 Cups	<b>0.2</b>	0.1	1.0
>3 Cups	<b>0.4</b>	0.1	1.7





# Benefits of Breastfeeding



- **Psychosocial Effects**
- **Economic Effects**
- **Environmental Effects**
- **Endorsement of Breastfeeding as the Best Nutrition for Infants**

Source: Office of the Surgeon General (US); Centers for Disease Control and Prevention (US); Office on Women's Health (US).

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## Benefits of Reducing Soda Consumption

Frequent ingestion of soda has been identified by Tribal health programs as a factor contributing to increased dental decay in Alaska Natives. Frequent ingestion of soda contributes to dental decay through two mechanisms:

- Non-diet sodas are a major source of sugar; and
- Most sodas, like citrus drinks, have a relatively low pH (acidic)

These factors result in increased acid production by the bacteria causing dental decay as well as demineralization of teeth due to the low pH of these drinks.



Source: Alaska Oral Health Plan

“Investments that bolster the parenting capacities of families are the most effective way to promote social mobility and foster equal opportunities.”



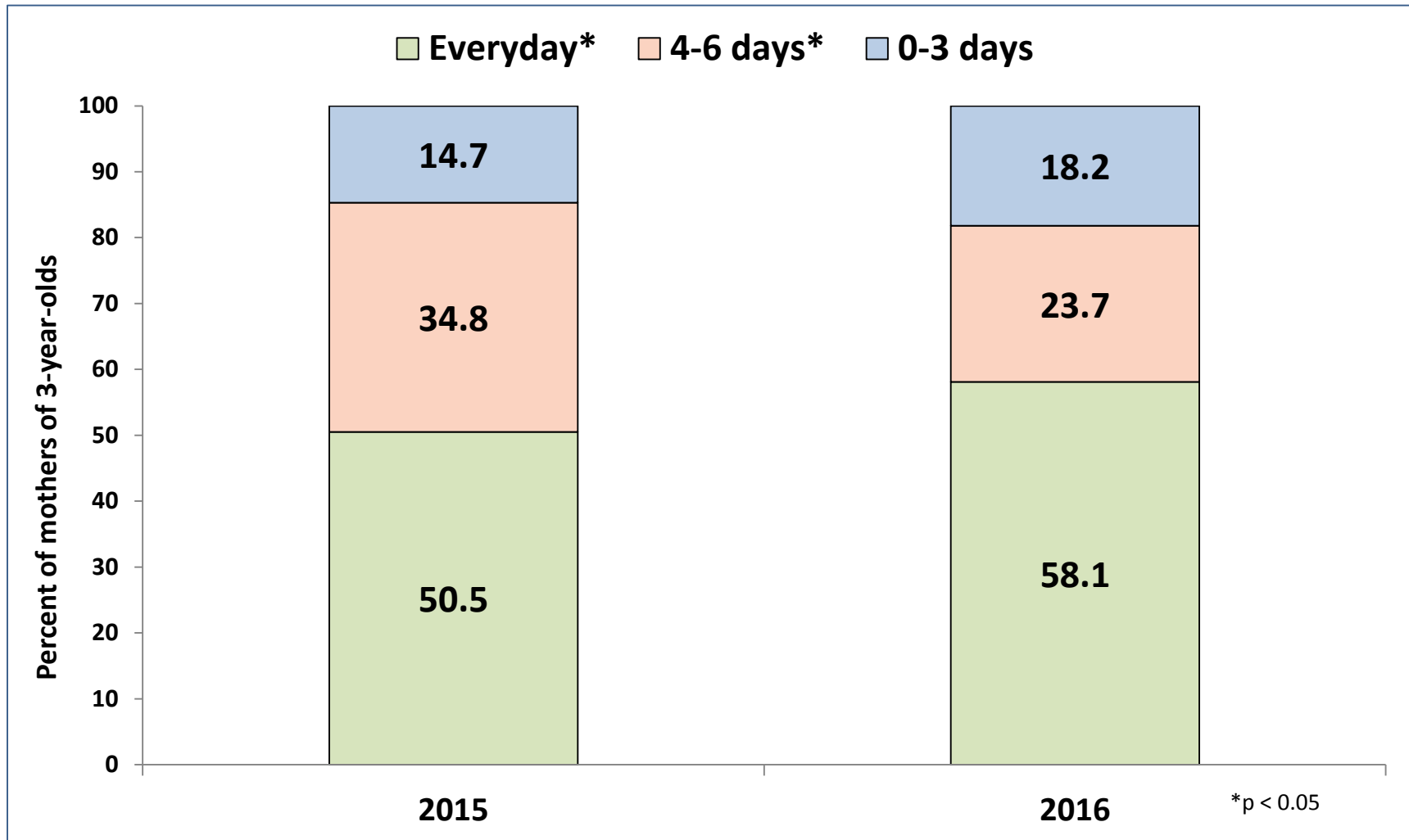
**Professor James Heckman**

Nobel Laureate in Economics

April 21<sup>st</sup> , 2015, Education Writers Association National Seminar

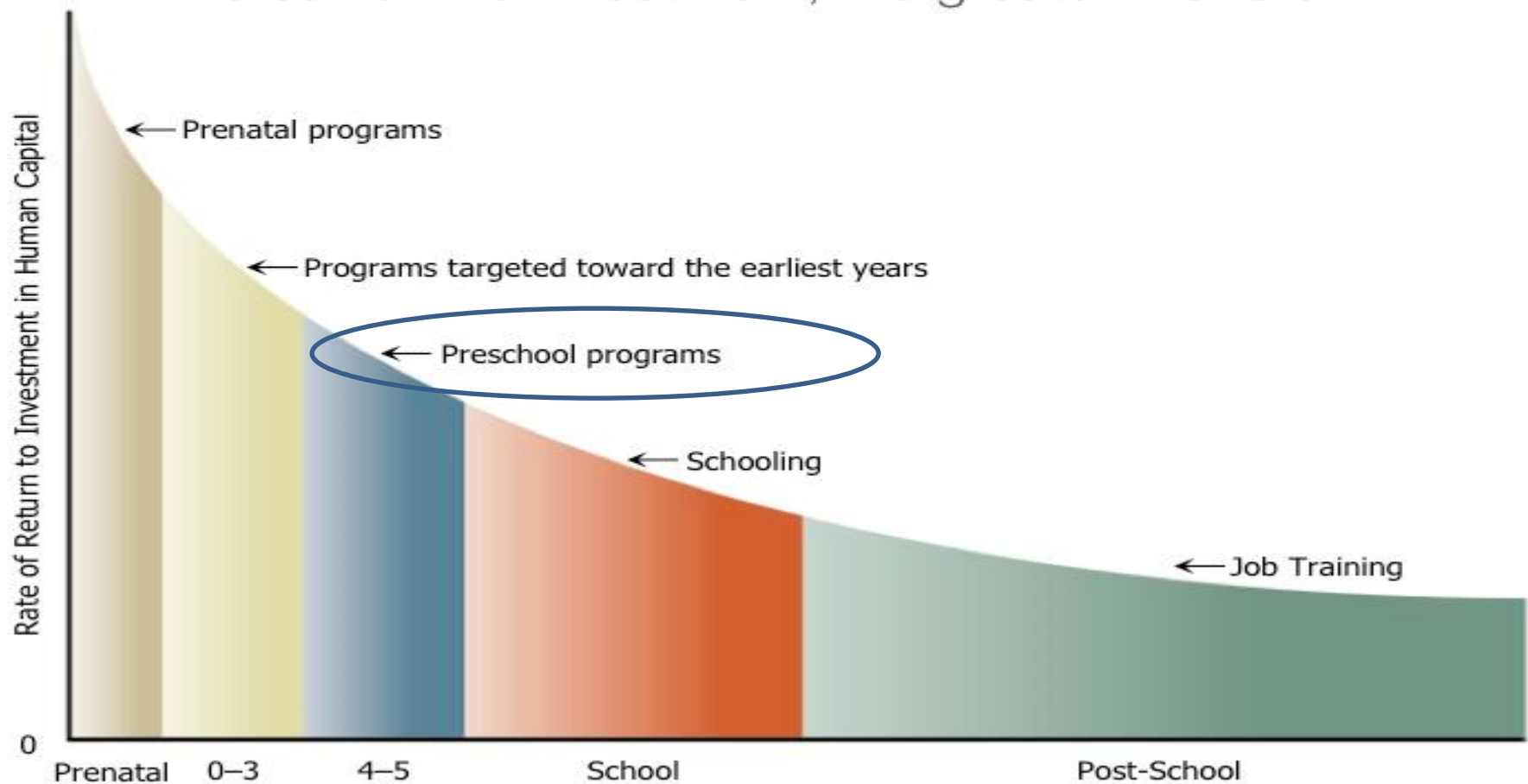
**LEARN MORE AT [HECKMANEQUATION.ORG](http://HECKMANEQUATION.ORG)**

# Days per week read book or a story with young child



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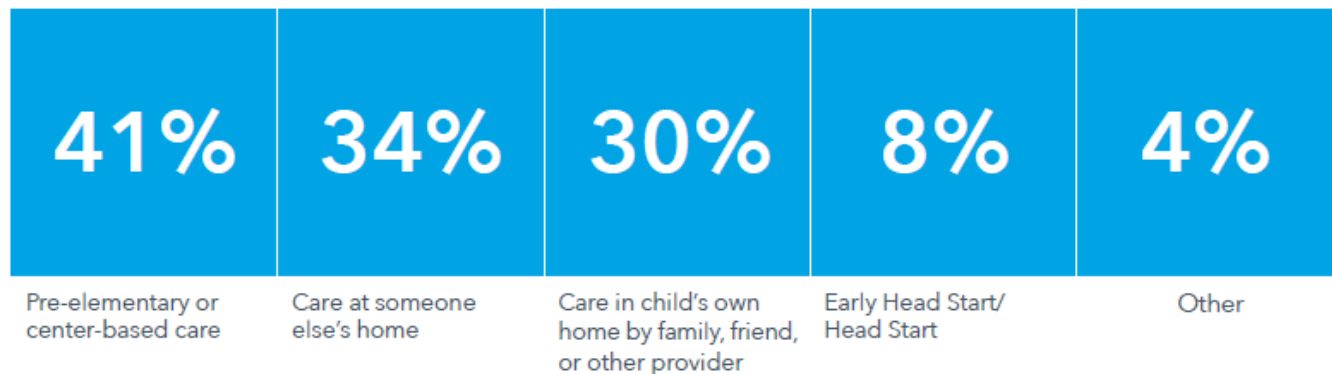


Source: James Heckman, Nobel Laureate in Economics

# Types of Early Care and Learning Services Utilized

Type of early care and learning services received varies by age group. Results include children in multiple types of care.

## Under 6 years of Age



55% of Children under age 6 receive care by someone other than their parent or guardian

55%

## Under 6 years of Age



14%  
Very difficult

12%  
Very easy

4%  
Don't know/  
refused

32%  
Difficult

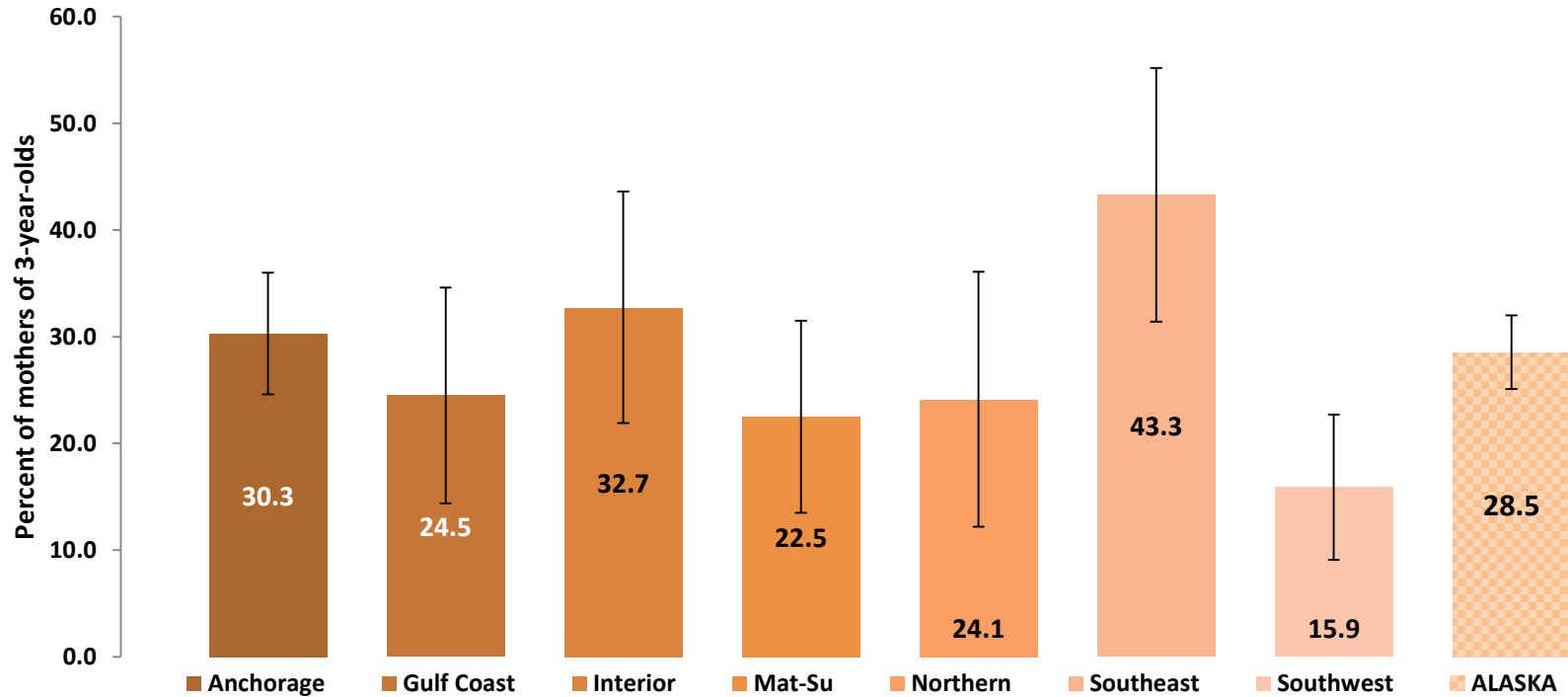
38%  
Easy

# Attends Preschool\*

## 3-year-old child currently attends preschool by region

Source: Alaska CUBS, 2015-2016

(N = 992)



James Heckman, from *Lifecycle Benefits*

High quality birth-to-five programs for disadvantaged children can deliver a

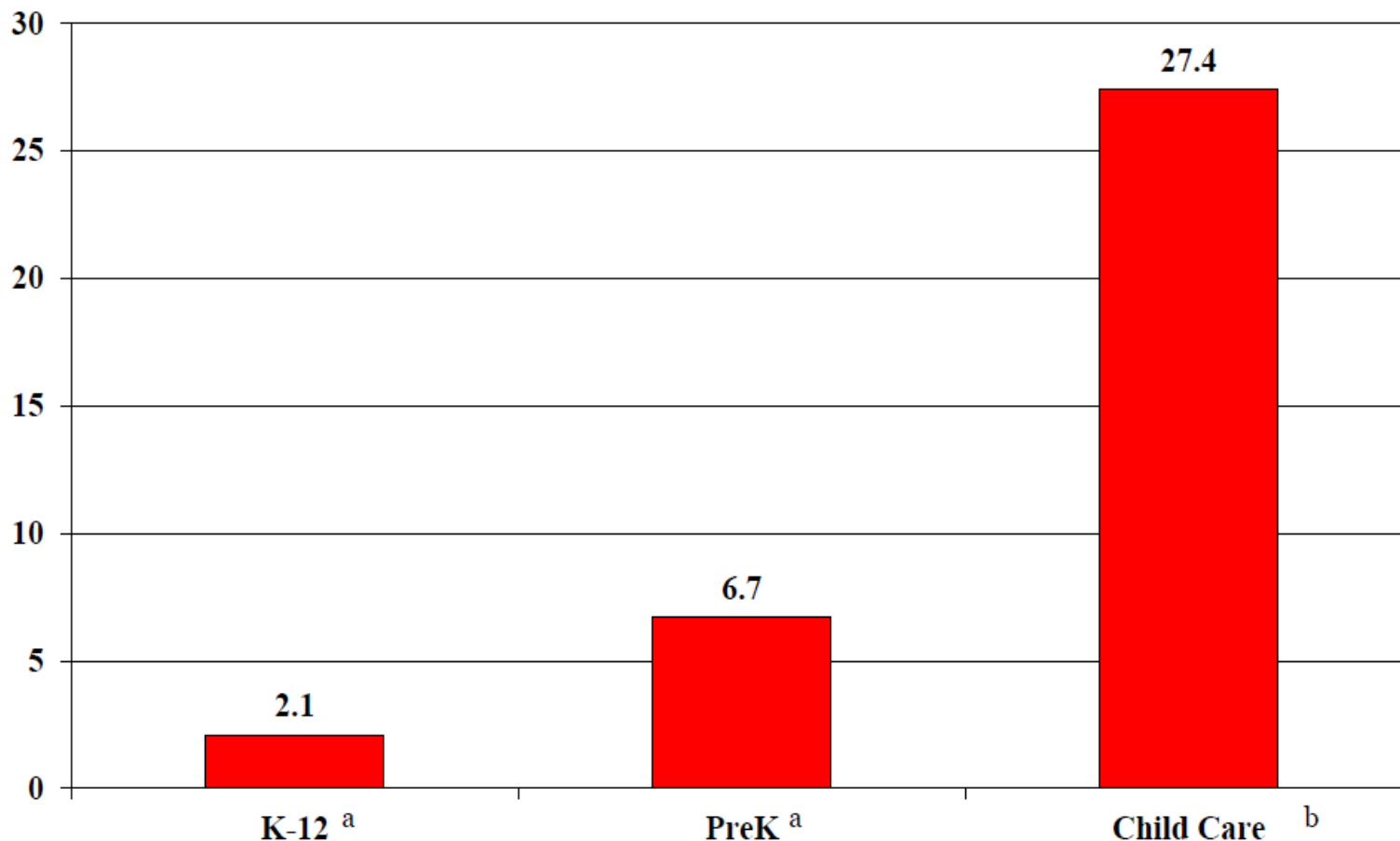
**13%**  
Return on Investment

Starting earlier provides greater returns. Learn more.

[www.heckmanequation.org](http://www.heckmanequation.org)



# Expulsion Rates (per 1,000)

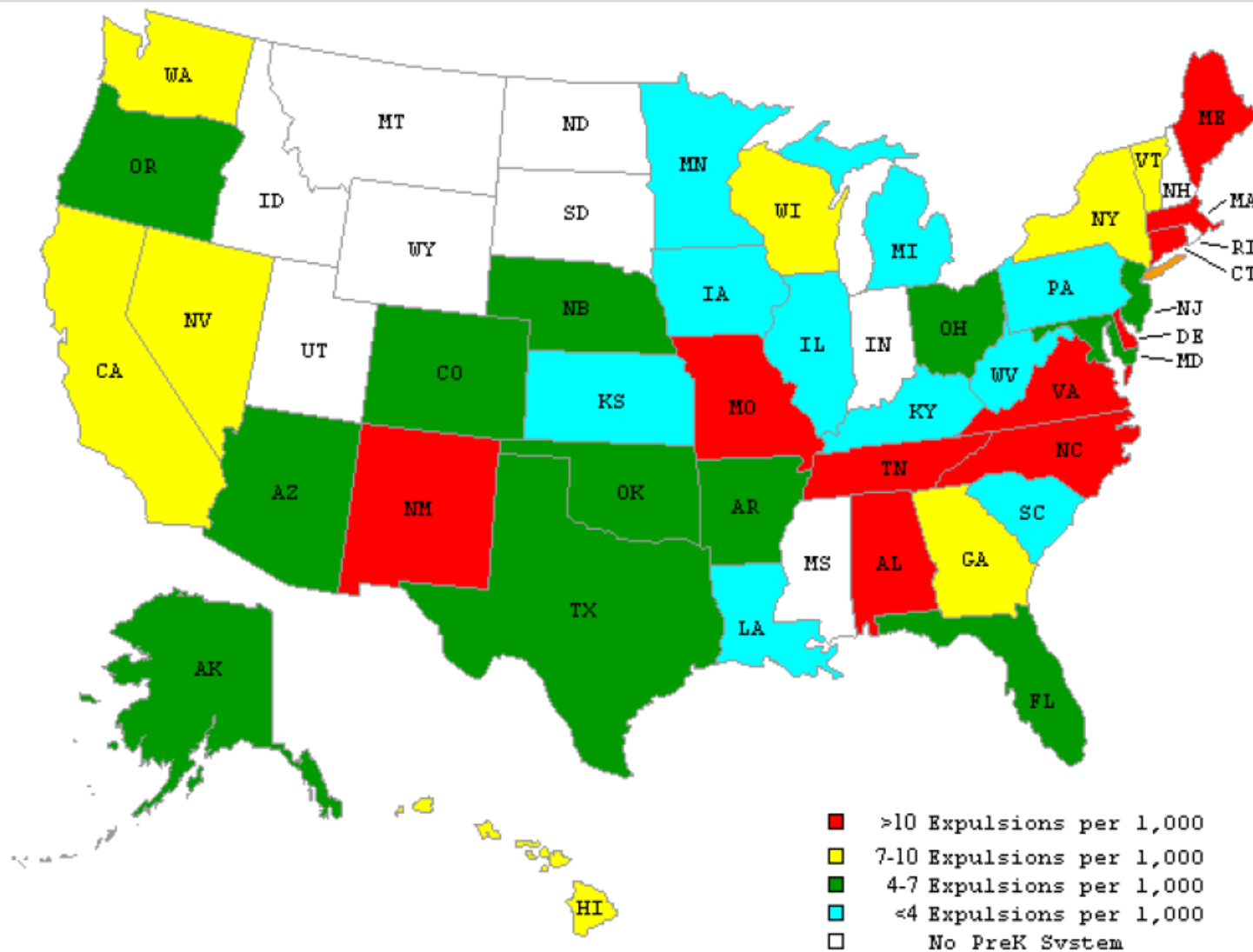


a. Gilliam, WS (2005). Prekindergarteners left behind: Expulsion Rates in state prekindergarten programs. *FCD Policy Brief, Series No. 3*. Available: [www.ziglercenter.yale.edu/publications/briefs.html](http://www.ziglercenter.yale.edu/publications/briefs.html)

b. Gilliam, WS & Shahar, G (2006). Preschool and child care expulsion and suspension: Rates and predictors in one state. *Infants and Young Children, 19*, 228-245.

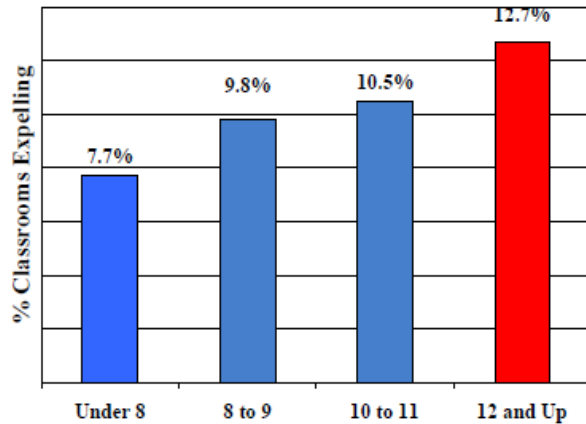


# State PreK Expulsion Rates

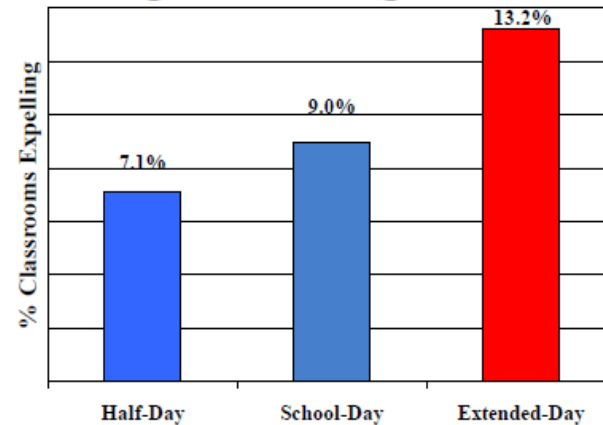


# Many Factors Predict Preschool Expulsion

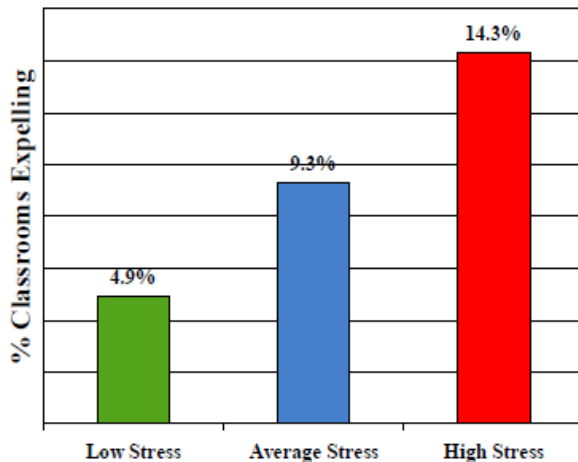
## Child-Teacher Ratio



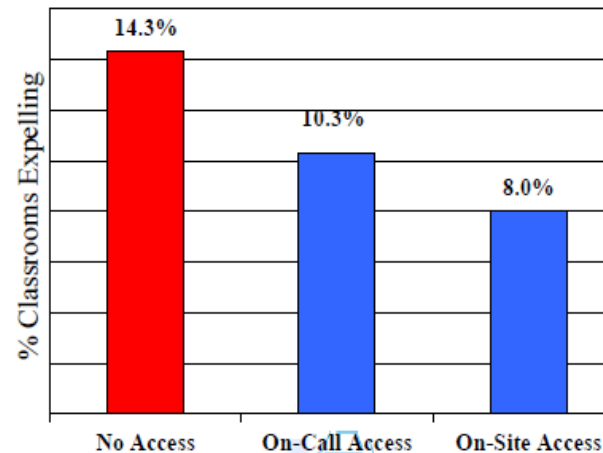
## Program Length of Day



## Teacher Job Stress

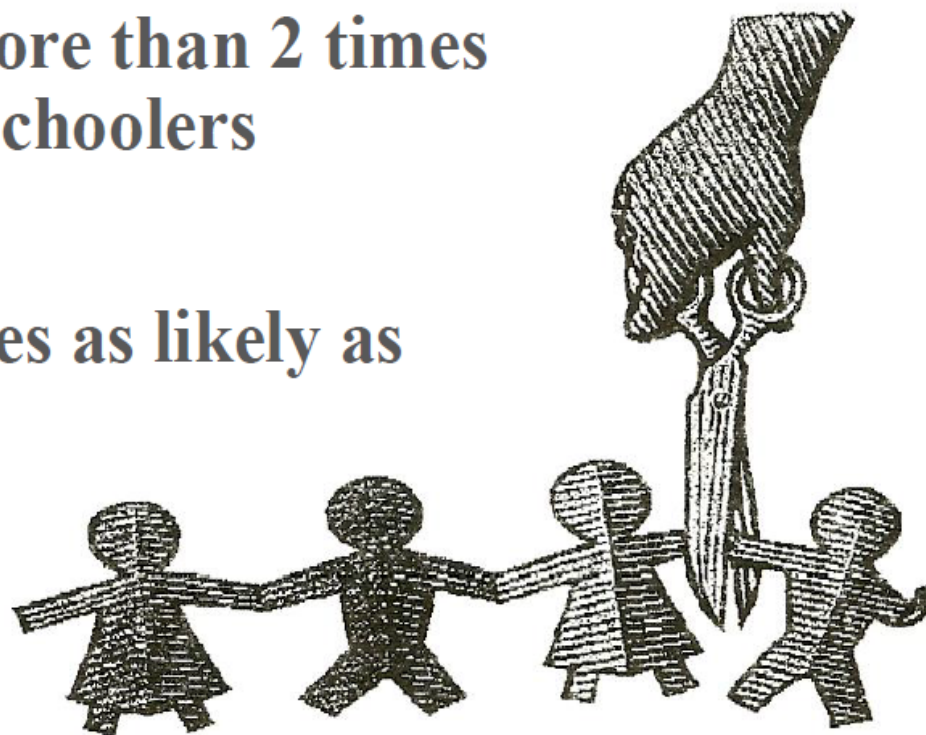


## Access to Behavioral Supports

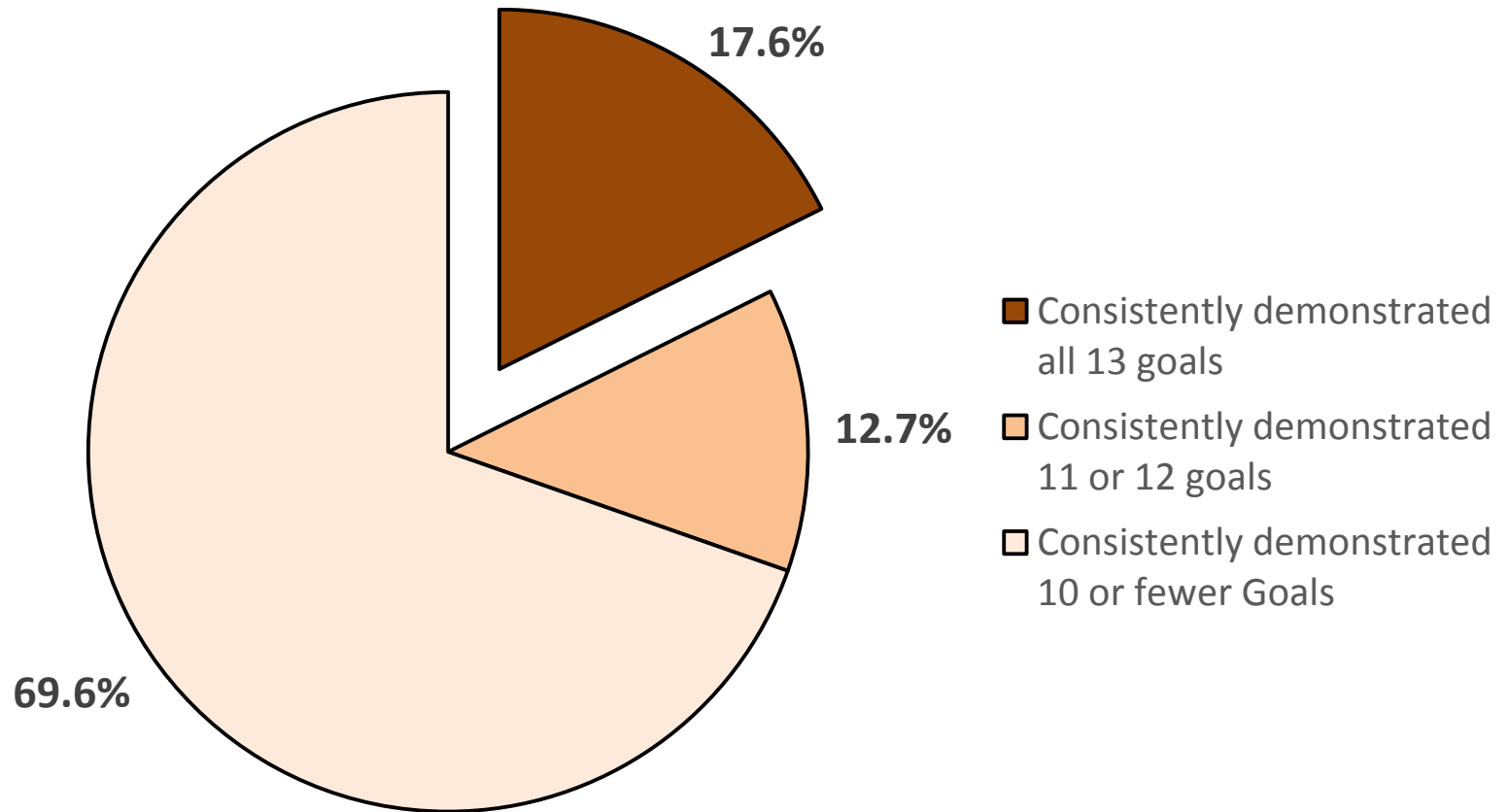


# Who Gets Expelled?

- **4-year-olds 50% more likely than 3's**
- **Black preschoolers more than 2 times as likely as white preschoolers**
- **Boys more than 4 times as likely as girls**

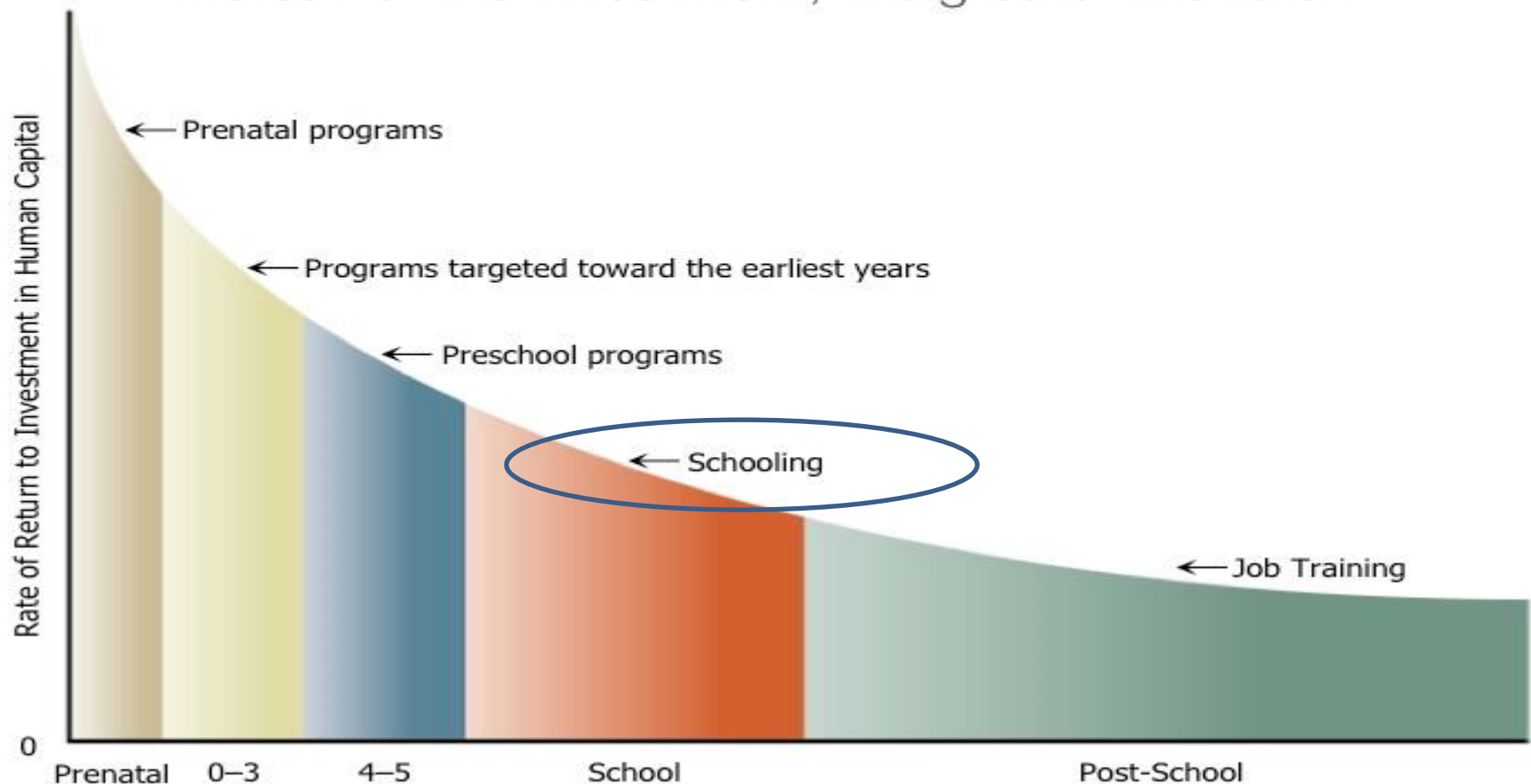


# Statewide 2017-2018 results



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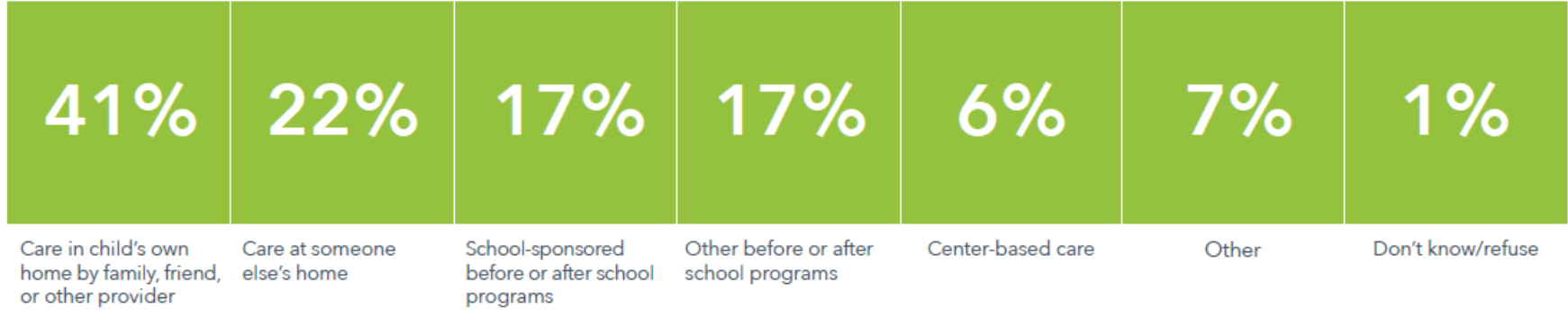


Source: James Heckman, Nobel Laureate in Economics

# Types of Early Care and Learning Services Utilized

Type of early care and learning services received varies by age group. Results include children in multiple types of care.

## 6 through 12 years of age



**42% of children age 6 to 12 receive care by someone other than their parent or guardian**

42%

## 6 through 12 years of age



10%  
Very difficult

16%  
Very easy

7%  
Don't know/  
refused

18%  
Difficult

49%  
Easy

QUALITY EARLY CHILDHOOD DEVELOPMENT  
**WORKS**



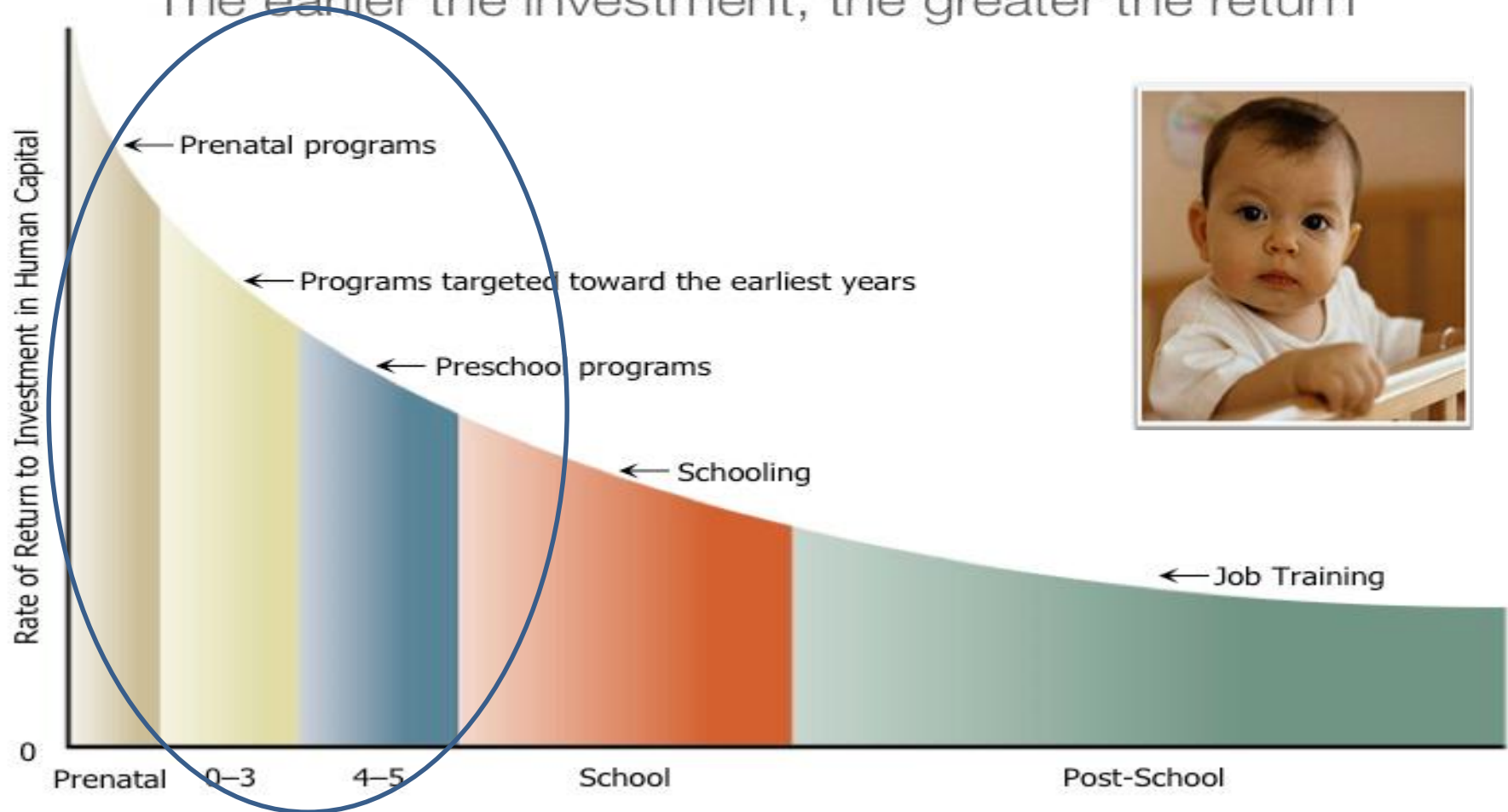
"We do have effective programs that have been proven to work. They work because they start early, they supplement the family life – they work with the family, they don't replace the family."

**James Heckman**  
Nobel Laureate in Economics



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Source: James Heckman, Nobel Laureate in Economics



# Annual prevalence – 3 estimates



On average –

~ 15,000 children are  
reported

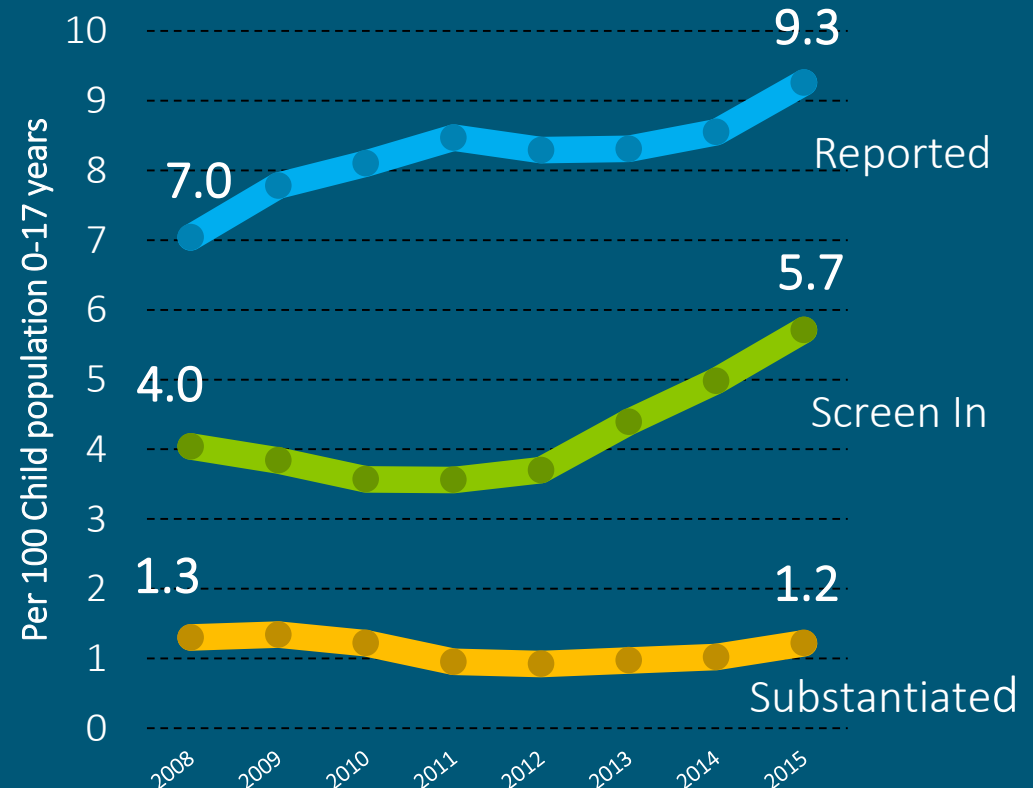
~ 8,000 children are  
screened in

~ 2,000 children are  
substantiated

to/by OCS annually

- The number of reports and screen ins has significantly increased since 2008

Prevalence per 100 children

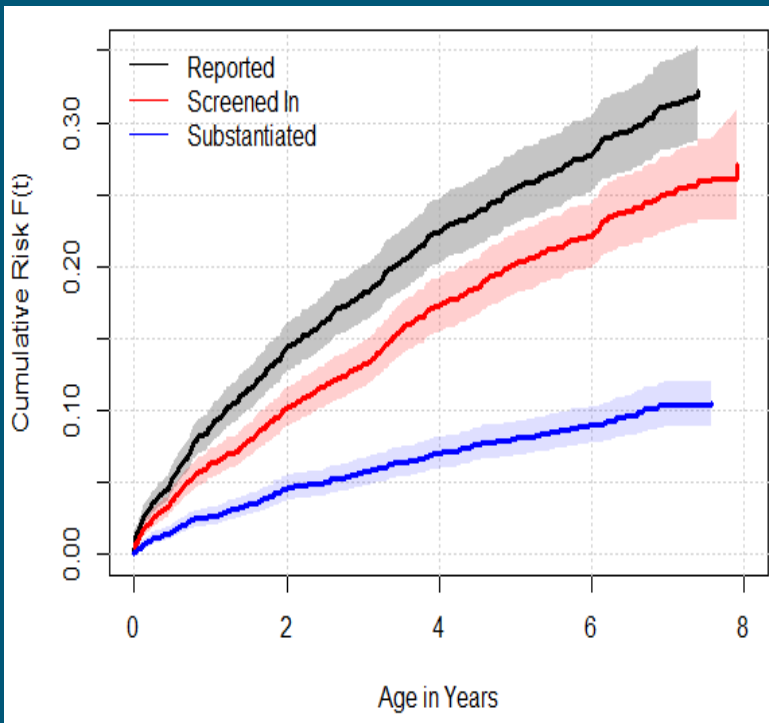


# ALCANLink – lifetime risk

Alaska Longitudinal Child Abuse and Neglect Linkage Project



Among children born during 2009:2011 in Alaska,  
before age 8



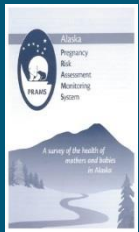
- **32%** experienced a report to OCS
- **27%** experienced a screened-in report to OCS
- **10%** experienced a substantiated report to OCS

# New emerging data resources

## Alaska Longitudinal Child Abuse and Neglect Linkage Project



Moving beyond describing the issue from an adult perspective to documenting the health and development over the life course

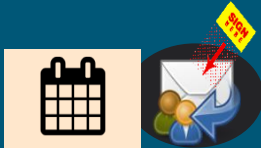


## Alaska Pregnancy Risk Assessment Monitoring System (Alaska PRAMS)

Follow-up



Administration and response



Maternal experiences



2009:201

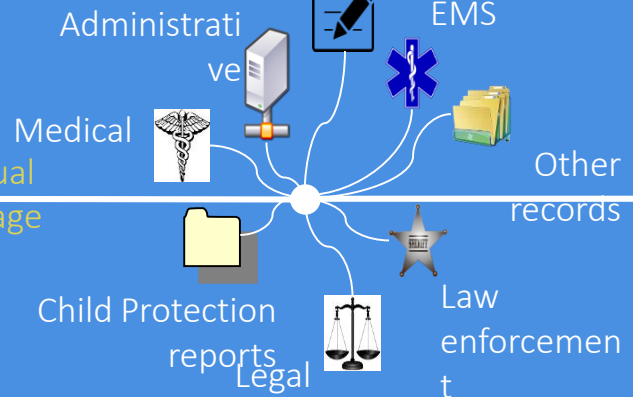
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Annual Linkage

## Alaska Longitudinal Child Abuse and Neglect Linkage Project (ALCANLink)

Survey

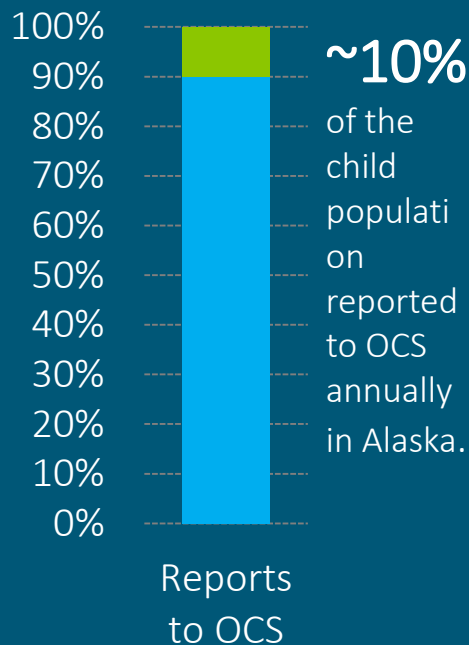


# Maltreatment burden

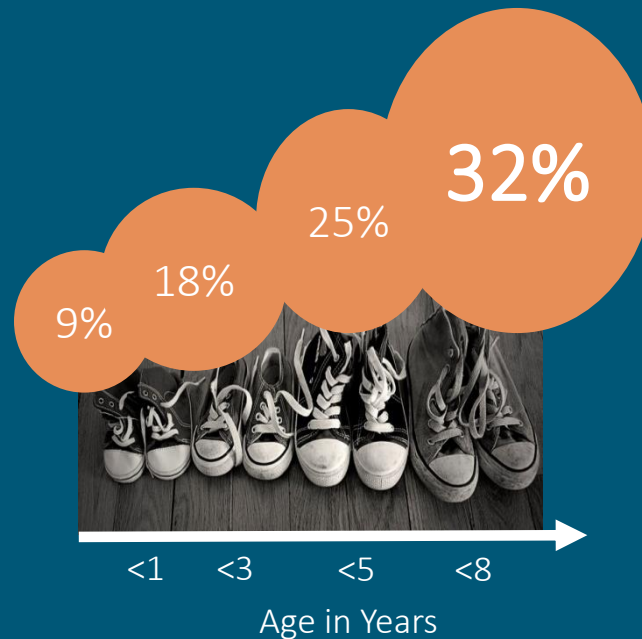
## Alaska Longitudinal Child Abuse and Neglect Linkage Project



Annual Prevalence  
(children ages 0-17 years,  
2012-2015)

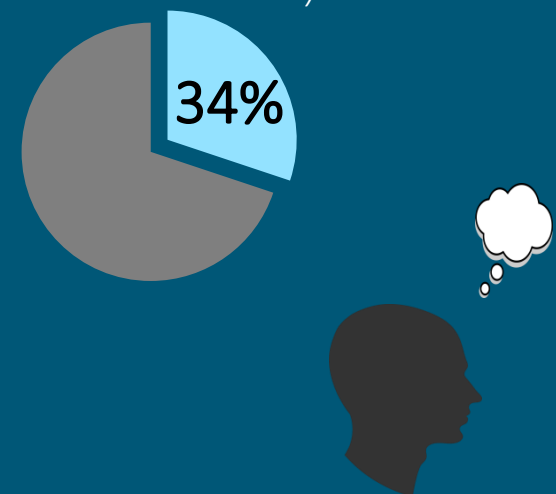


Cumulative  
Incidence (reported to  
OCS before age x)



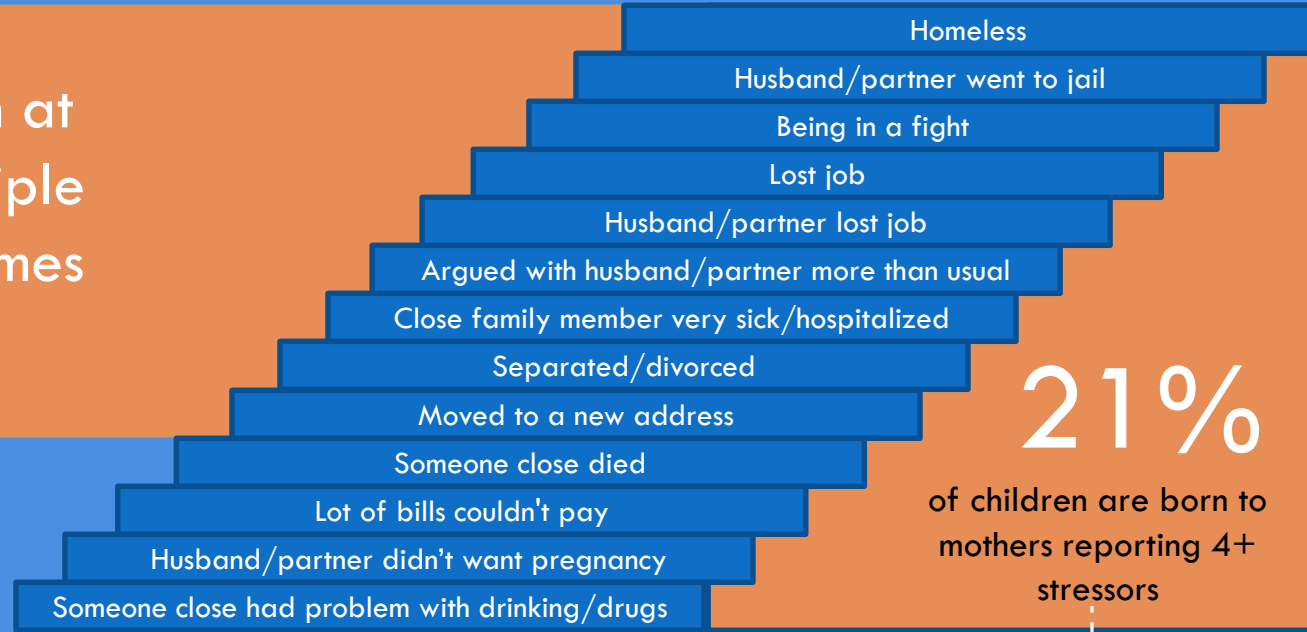
Adult prevalence  
(recall of experiences during  
childhood)

Reported physical or sexual abuse, physical neglect, or emotional neglect. (BRFSS 2014-2015)



# Maternal Stressors

Household dysfunction at birth can lead to multiple negative health outcomes (ACEs)



Before the age of 7

**1 in 2**

children born to mothers reporting 4+ stressors were reported for maltreatment



Compared to those mothers reporting no stressors, the risk of a child being reported for maltreatment increases with the number of stressors reported (stepwise increase)

# Linking Data to Policy

**ALCANLink**

**- 1115 Medicaid Waiver Application**

Cumulative Incidence  
(reported to OCS before age 8)



“This proposal focuses on establishing an enhanced set of benefits for three target populations of Medicaid recipients: 1) Children and adolescents who are interacting or at risk of interacting with the child welfare system..... (as identified using indicators from the Alaska Longitudinal Child Abuse and Neglect Linkage Project)” ....” This waiver would provide an important vehicle for strengthening the support system for these young people in hopes of anticipating and preventing crises and reducing the need for out-of-home placements over time.”

# Wired Up – Wired Down



At a Child's Birth



at 7 Years Old



at 15 Years of Age

• **Positive Stress-**  
moderate, short-lived  
stress responses,  
such as brief  
increases in heart rate  
or mild changes in  
stress hormone levels





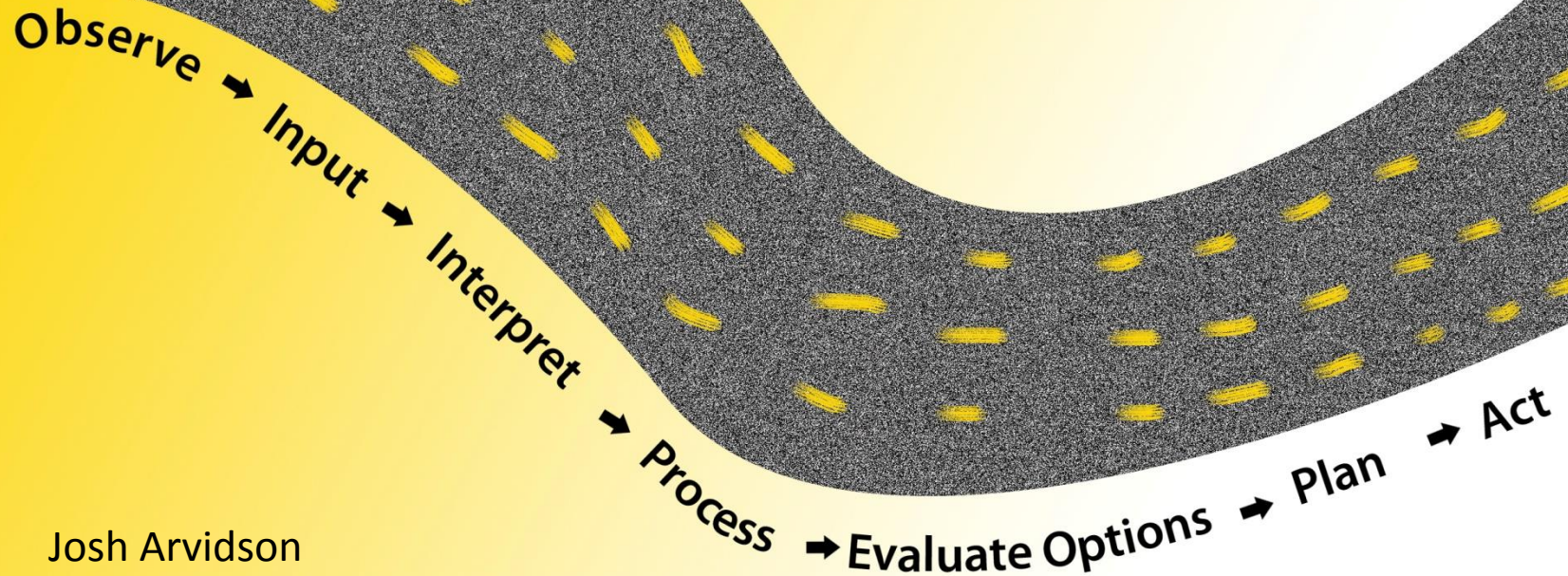
- **Tolerable Stress-** could disrupt brain architecture but is buffered by supportive relationships that facilitate adaptive coping



• **Toxic Stress-** strong and prolonged activation of the body's stress management systems in the absences of the buffering protection of adult support



# Brain process under typical conditions



Josh Arvidson

# Alarm system "Express Route"

Observe → Interpret

**DANGER**

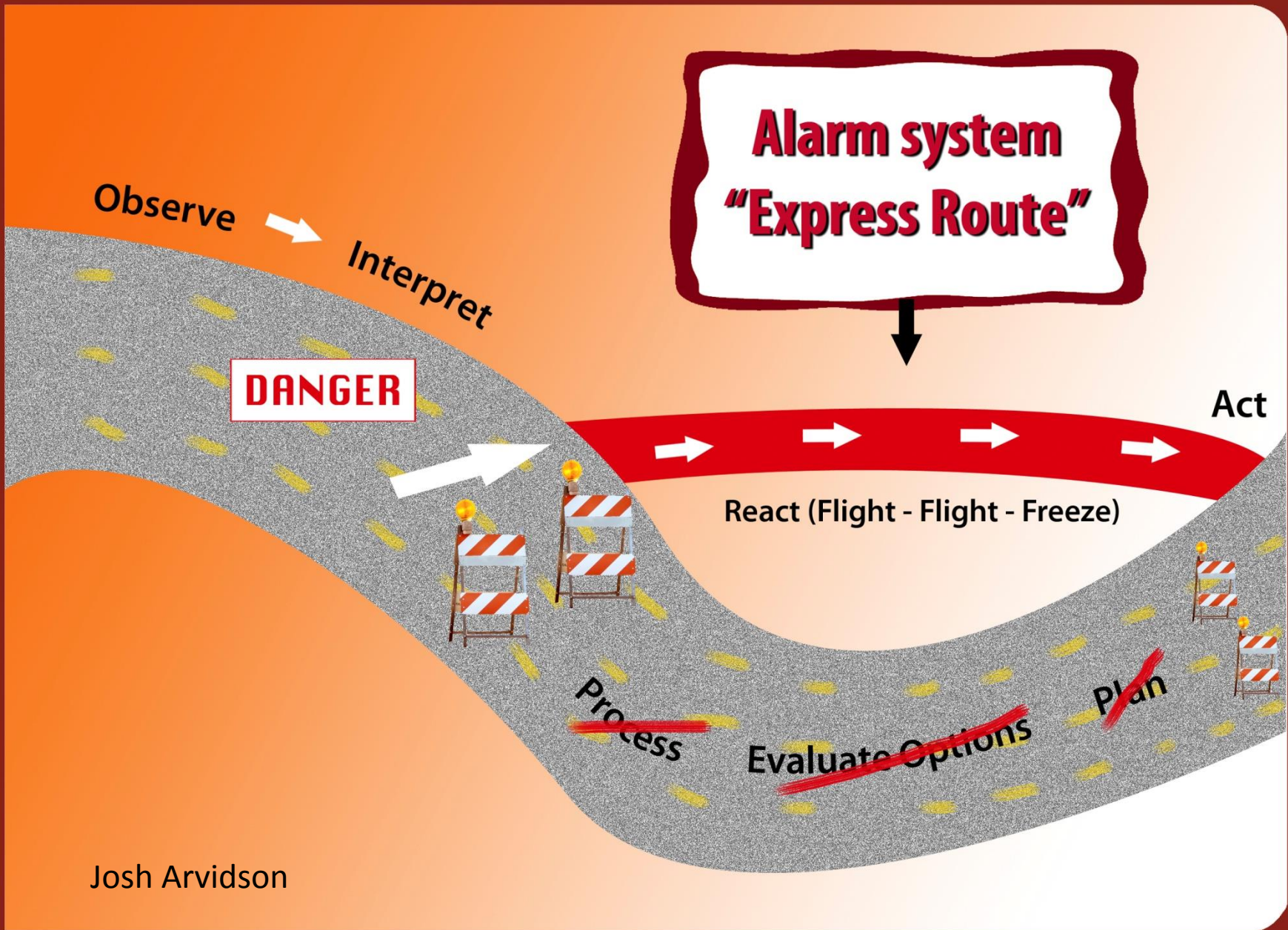
Act

React (Flight - Flight - Freeze)

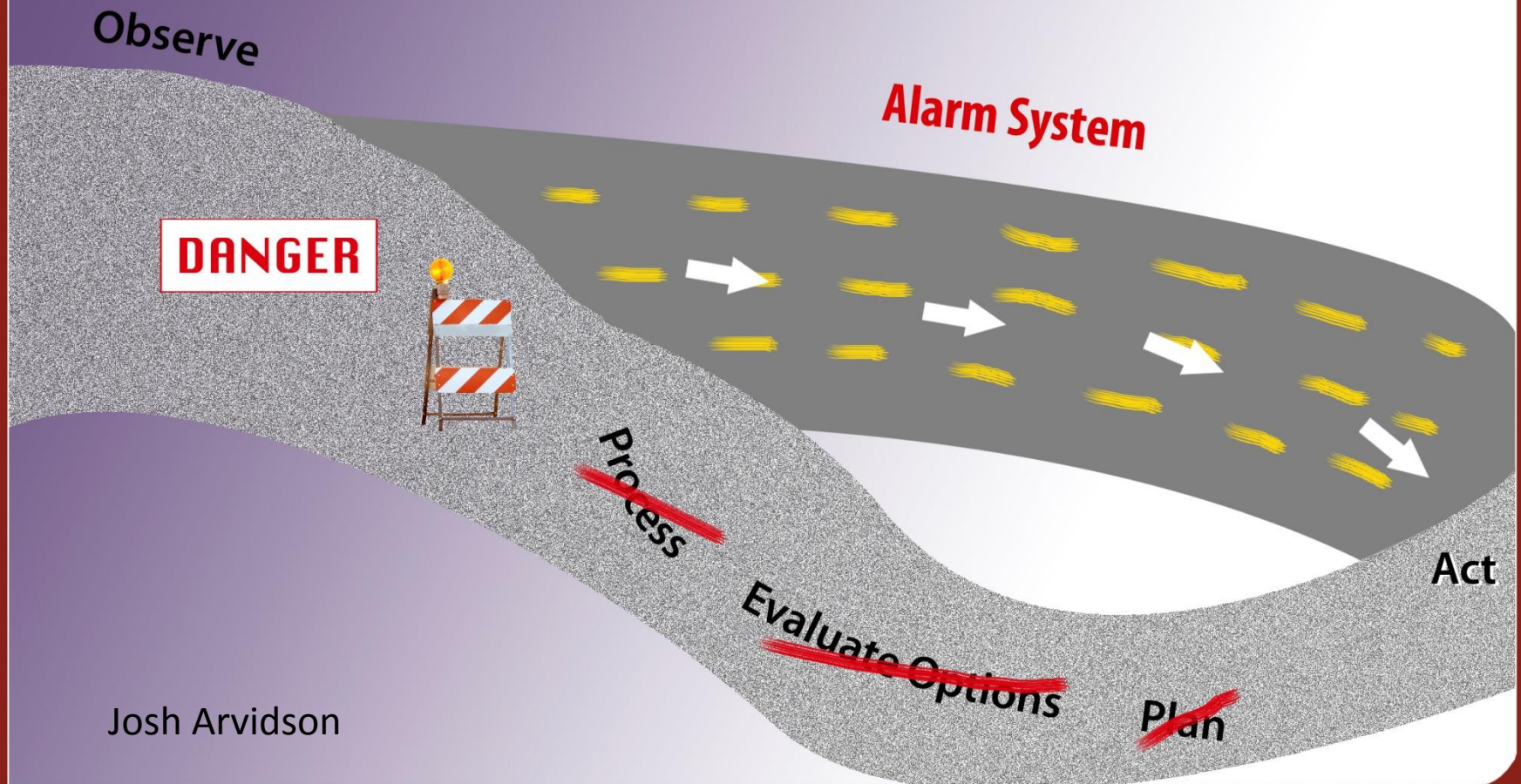
~~Process~~

~~Evaluate Options~~


~~Plan~~



With repeated stress, the Alarm System  
"Express Route" becomes the main road



Josh Arvidson



“Self-control, openness, the ability to engage with others, to plan and to persist – these are the attributes that get people in the door and on the job and lead to productive lives.”



**James Heckman**  
Nobel Laureate in Economics



# SEVEN KEY PRINCIPLES OF SELF-REGULATION

## SELF-REGULATION:

- serves as the foundation for lifelong functioning
- is defined from an applied perspective as the act of managing cognition and emotion
- enactment is influenced by a combination of individual and external factors
- can be strengthened and taught
- is dependent on “co-regulation” provided by parents or other caregiving adults
- can be disrupted by prolonged or pronounced stress and adversity including poverty and trauma experiences
- develops over an extended period from birth through young adulthood and beyond

Murray, Desiree W., Rosanbalm, Katie, Christopoulos, Christina, and Hamoudi, Amar (2015). **Self-Regulation and Toxic Stress: Foundations for Understanding Self- Regulation from an Applied Developmental Perspective.** OPRE Report #2015-21, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

# Self Regulation

1. Finishes tasks and follows through on commitments
2. Stays calm and in control when facing a challenge
3. Shows interest and curiosity in learning new things

## *Self-Regulation*



*Curious*

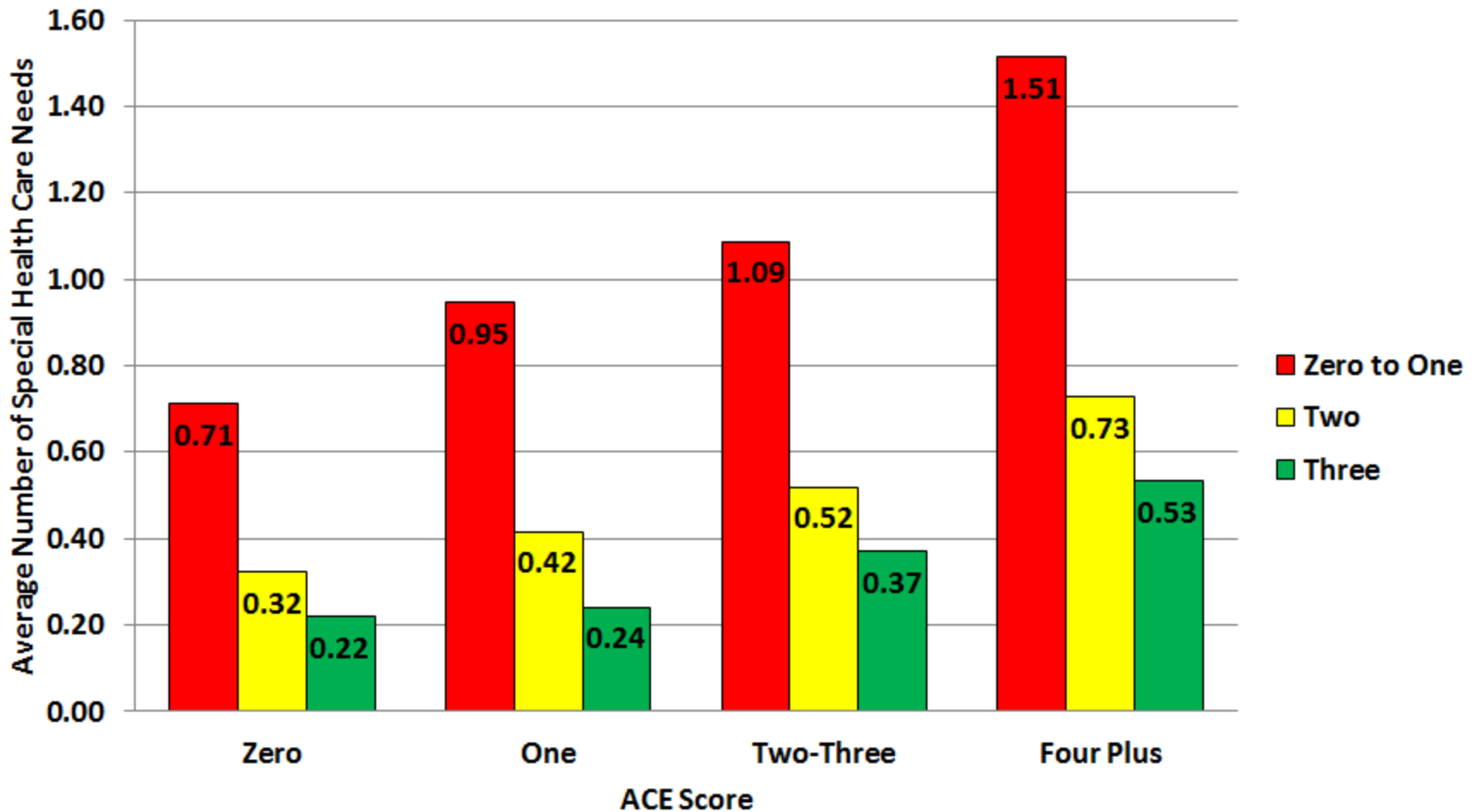
*Reliable*

*Focused*

**Source:** Child and Adolescent Health Management Initiative (2012). "2011-2012 National Survey of Children's Health (2012), U.S. Department of Health and Human Services, Health Resources and Services Administration. Graphics and analysis done by the Alaska Mental Health Board and Advisory Board on Alcoholism and Drug Abuse Staff



## Average Number of CSHCN Conditions by ACE Score and Number of Self-Regulation Skills (Age 6-17)



**Source:** Child and Adolescent Health Management Initiative (2012). "2011-2012 National Survey of Children's Health (2012), U.S. Department of Health and Human Services, Health Resources and Services Administration. Graphics and analysis done by the Alaska Mental Health Board and Advisory Board on Alcoholism and Drug Abuse Staff

# Questions

At what age are children in the U.S. most likely to be expelled from school?

**4 years old**

What percentage of Alaskan children age 6 and under receive care by someone other than their parent or guardian?

**55%**

By age eight, what percentage of Alaskan children have had a first report of harm made to OCS?

**32% or about 30,614**

What percentage of Alaskan children at the start of Kindergarten regulate their feelings and impulses?

**45.5%**

What skills can mitigate the health impact of toxic levels of stress in childhood?

**Self-Regulation Skills**

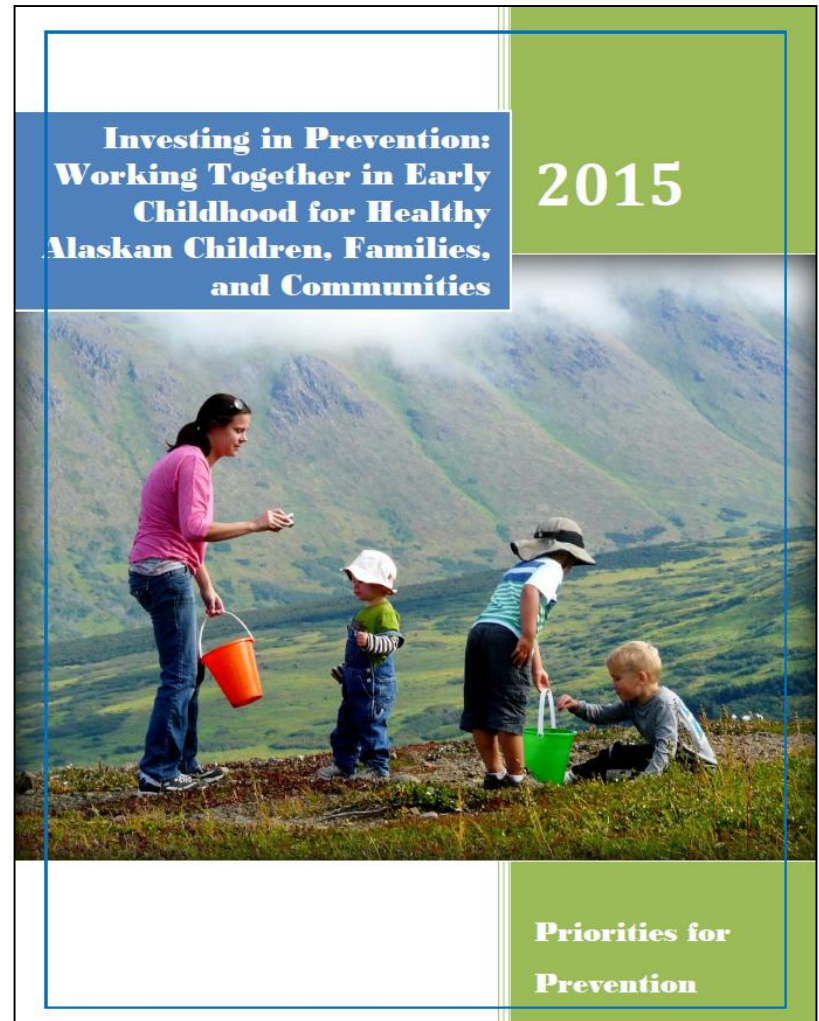
# Priorities for Prevention

Support quality early childhood programs.

Ensure access to health care including behavioral health care.

Strengthen capacity for social emotional learning throughout Alaska's schools.

Maintain and expand prevention efforts that have proven to be effective.



# Thank you



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