



Childhood Obesity

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Obesity in AI/AN Youth

- “Obesity and Overweight in American Indian and Alaska Native Children, 2006–2015”

Am J Public Health 2017;107:1502-1507

- Key findings:
 - Obesity in AI/AN youth ages 2-19 years has been stable for the past decade
 - Small increase in class 3 obesity
 - Children ages 2 to 5 years had the lowest prevalence of obesity and a consistent decrease from 23.2% in 2010 to 20.7% in 2015

Obesity and Overweight in American Indian and Alaska Native Children, 2006–2015

Ann Bullock, MD, Karen Sheff, MS, Kelly Moore, MD, and Spero Manson, PhD

Objectives. To estimate obesity and overweight prevalence in American Indian and Alaska Native (AI/AN) children across genders, ages, and geographic regions in the Indian Health Service active clinical population.

Methods. We obtained data from the Indian Health Service National Data Warehouse. At least 184 000 AI/AN children aged 2 to 19 years had body mass index data for each year studied, 2006 to 2015. We calculated body mass index percentiles with the 2000 Centers for Disease Control and Prevention growth charts.

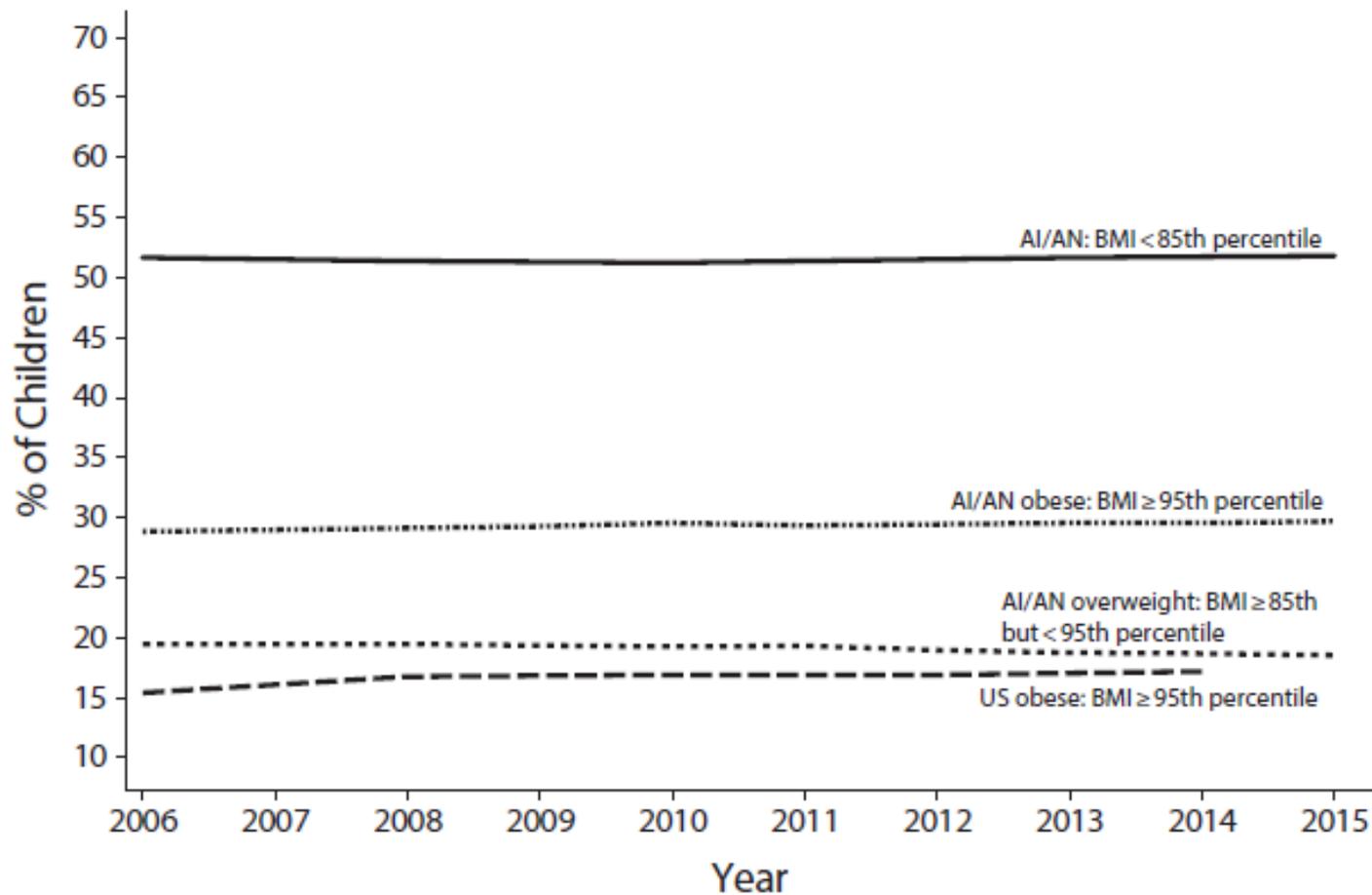
Results. In 2015, the prevalence of overweight and obesity in AI/AN children aged 2 to 19 years was 18.5% and 29.7%, respectively. Boys had higher obesity prevalence than girls (31.5% vs 27.9%). Children aged 12 to 19 years had a higher prevalence of overweight and obesity than younger children. The AI/AN children in our study had a higher prevalence of obesity than US children overall in the National Health and Nutrition Examination Survey. Results for 2006 through 2014 were similar.

Conclusions. The prevalence of overweight and obesity among AI/AN children in this population may have stabilized, while remaining higher than prevalence for US children overall. (*Am J Public Health.* 2017;107:1502–1507. doi:10.2105/AJPH.2017.303904)

overweight in the Indian Health Service (IHS) active clinical population in each year from 2006 to 2015. In addition, we estimated prevalence by age, sex, and geographic region.

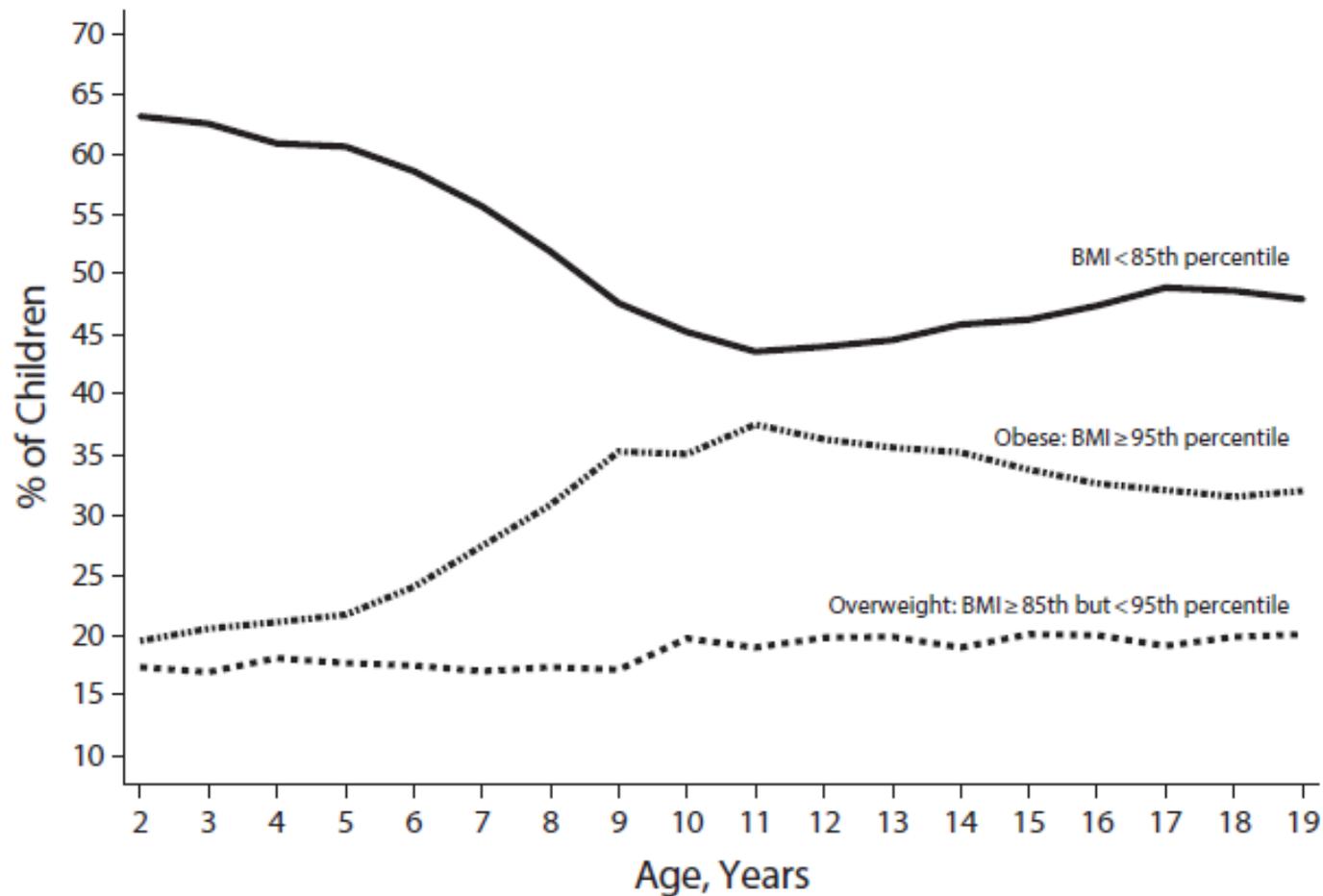
METHODS

We used data collected each fiscal year (October 1 to September 30) from 2006 to 2015 at federally funded health care facilities that serve AI/AN people across all 12 IHS administrative areas. The facilities include federally operated IHS hospitals and clinics, as well as facilities operated directly by tribal governments through contracts or compacts with the IHS. We also included urban Indian health organizations that provide services to AI/AN people residing in 34 metropolitan



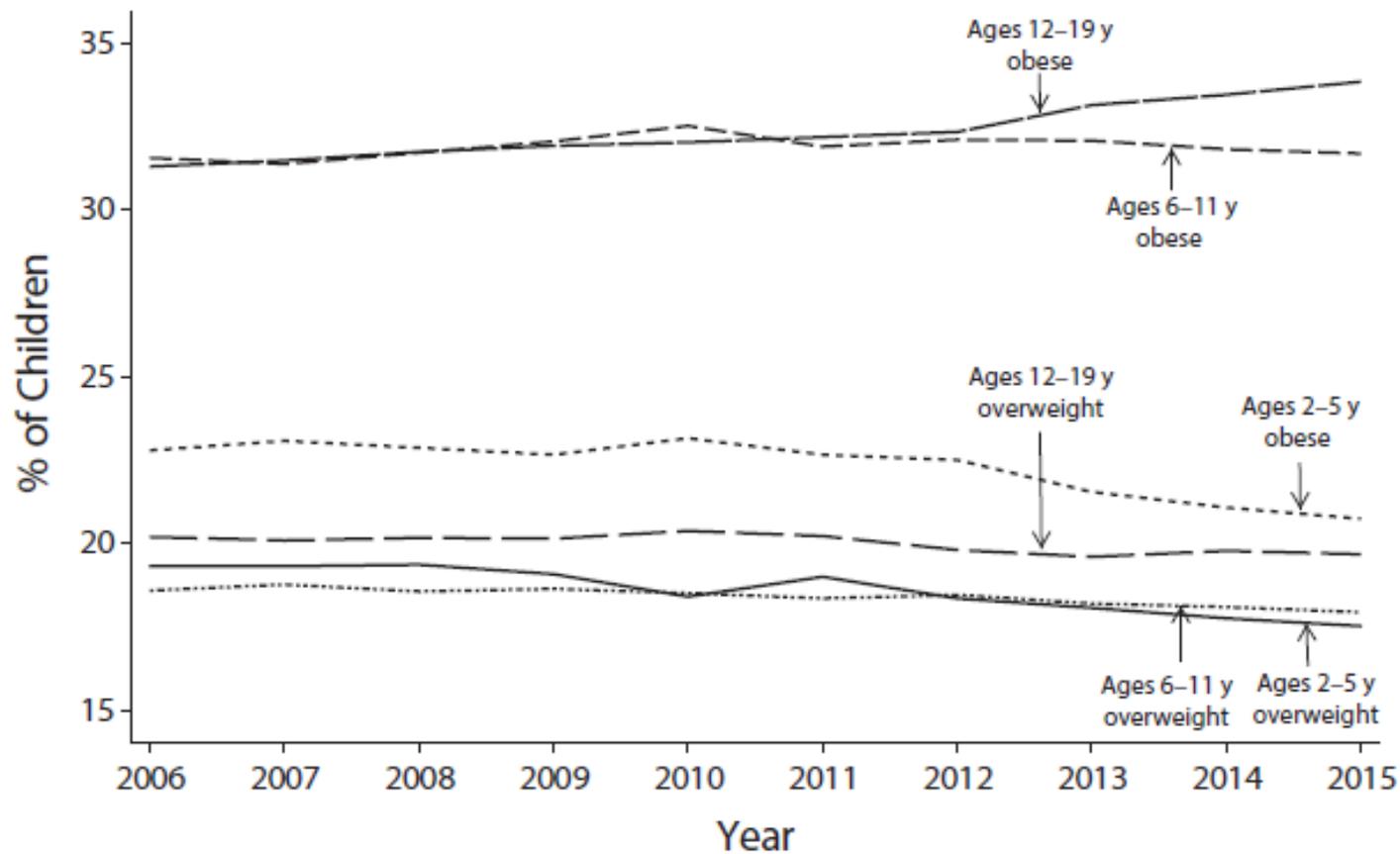
Notes. AI/AN= American Indian and Alaska Native; BMI =body mass index (kg/m²).

FIGURE 2—Body Mass Index Categories Among American Indian and Alaska Native Children Aged 2 to 19 Years and US Obesity: 2006–2015



Note. BMI = body mass index (defined as weight in kilograms divided by the square of height in meters).

FIGURE 1—Body Mass Index Category for American Indian and Alaska Native Children by Year of Age for Fiscal Year 2015, United States



Note. The y-axis range is smaller than in Figures 1 and 2.

FIGURE 3—Prevalence of Overweight and Obesity Among American Indian and Alaska Native Children Aged 2 to 19 Years by Fiscal Year and Age Group: 2006–2015, United States



What Happens Early Affects the Rest of Our Lives

“...many adult diseases should be viewed as developmental disorders that begin early in life...”

American Academy of Pediatrics

“The Lifelong Effects of Early Childhood Adversity and Toxic Stress”

Pediatrics 2012;129:e232-e246

“...a substantial component of metabolic disease risk has a prenatal developmental basis.”

Diabetes 2011;60:1528-1534

Low Birth Weight (SGA) and Preterm

- Babies can be either/both SGA and Preterm
 - they both are strongly associated with that baby's later risk for chronic disease *Diabetes 2009;58:523-526*
 - Inverse assoc between gest age and insulin levels at birth and early childhood *JAMA 2014;311:587-596*
- Maternal stressful life events during 1st trimester ↑ risk of preterm birth (OR 2.4) and SGA

Am J Obstet Gynecol 2010;203:34.e1-8

Emerging Science on Obesity Risk Factors

- Lower insulin sensitivity *predicts* decline in physical activity in peripubertal Hispanic and African American girls

Diabetes Care 2013;36:3739-3745

- Diet *quality* associated with weight gain *even if calories are restricted*
 - Overeating, ↓ physical activity as *consequences* of poor diet quality, stress

JAMA, published online May 16, 2014

Stress of Racism

- “The lifelong accumulated experiences of racial discrimination by African American women constitute an independent risk factor for preterm delivery.”
 - Odds ratio of 2.6
 - Independent of maternal sociodemographic, biomedical, and behavioral characteristics.

Am J Public Health 2004; 94:2132–2138

Stress and Obesity

- Chronic exposure to Intimate Partner Violence almost doubles (OR 1.8) risk of obesity at age 5 years

Arch Pediatr Adolesc Med 2010;164:540-546

- Toddlers who showed insecure attachment to their mothers at age 2 had a 30% increased risk of obesity by age 4 ½

Arch Pediatr Adolesc Med 2011;165:235-242

- “...reducing toxic stress can target the common physiologic pathway implicated in an enormous array of health outcomes from asthma to cardiovascular disease.”

Pediatrics 2013;131:319-327



Sorting out Stress and Trauma

- **Stress:** anything that requires a response, can be “good” or “bad”
- **Trauma:** anything that *overwhelms* our ability to respond, especially if we perceive that our life or our connection to things that support us physically or emotionally is threatened
 - Can cause lasting changes in the brain and body that increase risk for many problems
 - Any later experiences which remind the brain (amygdala) of prior trauma, can trigger same physical and emotional responses as at time of original trauma



Trauma in Children

- When trauma occurs during *development* of brain and body systems, can have lifelong impact
- Similar Terms:
 - **Toxic stress:** when a child experiences *strong, 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*.

Harvard Center on the Developing Child
 - **Complex Trauma** is both children's *exposure* to multiple traumatic events, often of an invasive, interpersonal nature, and the wide-ranging, long-term *impact* of this exposure.

National Child Traumatic Stress Network
- **Adverse Childhood Experiences (ACE):** abuse, neglect, and/or household dysfunction experienced in childhood
 - Increase risk at any level: graded, dose-response relationship



Adverse Childhood Experiences (ACEs)

- Physical Abuse
 - Emotional Abuse
 - Sexual Abuse
 - Family Substance Abuse
 - Family Mental Illness
 - Incarcerated Family Member
 - Parental Separation/Divorce
 - Seeing Mother Physically Abused
 - Physical Neglect
 - Emotional Neglect
-
- ACE “score” = number of **categories** experienced before age 18 yrs



ACES can have lasting effects on....



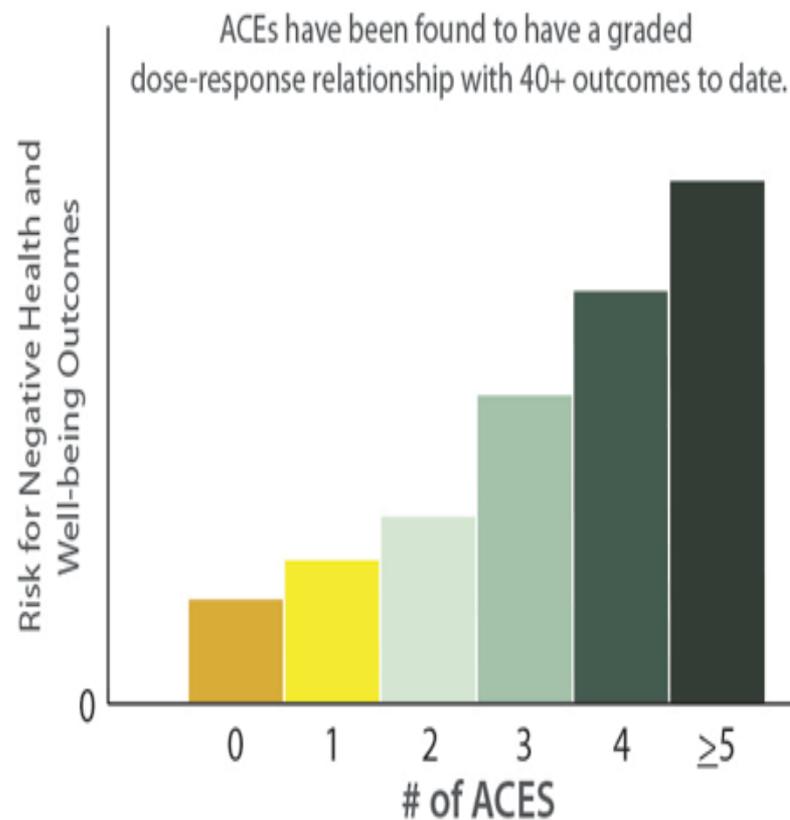
Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)



Behaviors (smoking, alcoholism, drug use)



Life Potential (graduation rates, academic achievement, lost time from work)



*This pattern holds for the 40+ outcomes, but the exact risk values vary depending on the outcome.



ACEs in Native People

- Study of ACE exposures in 1,660 AI adults from 7 southwest Tribes
- ACE prevalence was very high in all 7 Tribes studied
 - 2/3 of participants reported at least one parent with alcohol problems
 - Most common types of maltreatment:
 - Physical neglect ♂: 45% ♀: 42%
 - Physical abuse ♂: 40% ♀: 42%
 - Sexual abuse ♂: 24% ♀: 31%
 - Emotional abuse ♂: 23% ♀: 36%
 - Emotional neglect ♂: 20% ♀: 23%
- **1/3 had experienced ≥ 4 types of ACEs** *Am J Prev Med 2003;25:238-244*
- In the CDC/Kaiser ACE study, ACE scores ≥ 4 increased risk:
 - 4-12x for alcoholism, drug abuse, depression, suicide attempt
 - 2-4x for smoking, poor self-rated health, sexually transmitted infections
 - 1.4-1.6x for physical inactivity and severe obesity

Am J Prev Med 1998;14:245-258



ACEs in Native People

National Survey of Children's Health

- 1,453 AI/AN children aged 0-17 yrs compared with 61,381 white children from the 2011-2012 National Survey of Children's Health
- AI/AN children were more likely to have experienced:
 - 2+ ACEs (40.3% vs. 21%)
 - 3+ ACEs (26.8% vs. 11.5%)
 - 4+ ACEs (16.8% vs. 6.2%)
 - 5+ ACEs (9.9% vs. 3.3%)
- **AI/AN kids with 3+ ACEs compared with AI/AN with < 2 ACEs**
 - **Prevalence of depression, anxiety, ADHD 14.4%, 7.7%, 12.5% vs. 0.4%, 1.8%, 5.5%**
 - **School problems, grade failures, need for medication and counseling were 2-3x higher**

“Youth who overeat may have or be at risk for serious psychological distress, including deficits to self-esteem, compromised mood, and suicide risk. **Overeating may be a tangible behavior that signals the need for intervention.**”

Pediatrics 2003;111:67-74

What Works?



Association Between Casino Opening and Obesity

- 117 school districts that encompassed tribal lands in California between 2001 and 2012
 - 57 gained/expanded a casino
 - 24 had a preexisting casino but did not expand
 - 36 never had a casino
- Every slot machine per capita gained was assoc with a \$541 ↑ in per capita annual income and a decrease in percentage in poverty of 0.6% among AI living on tribal lands
 - **And ↓ probability of overweight/obesity of 0.19% in AI children**

JAMA 2014;311:929-936

What can we do?

- Encourage Breastfeeding
- Talk with parents about:
 - Physical activity, screen time, juices and sugar-sweetened beverages
 - Parenting skills
- Interventions
 - Home Visiting
 - Excellent child care/Head Start
 - Screen for and address ACEs and their effects
 - Food Insecurity



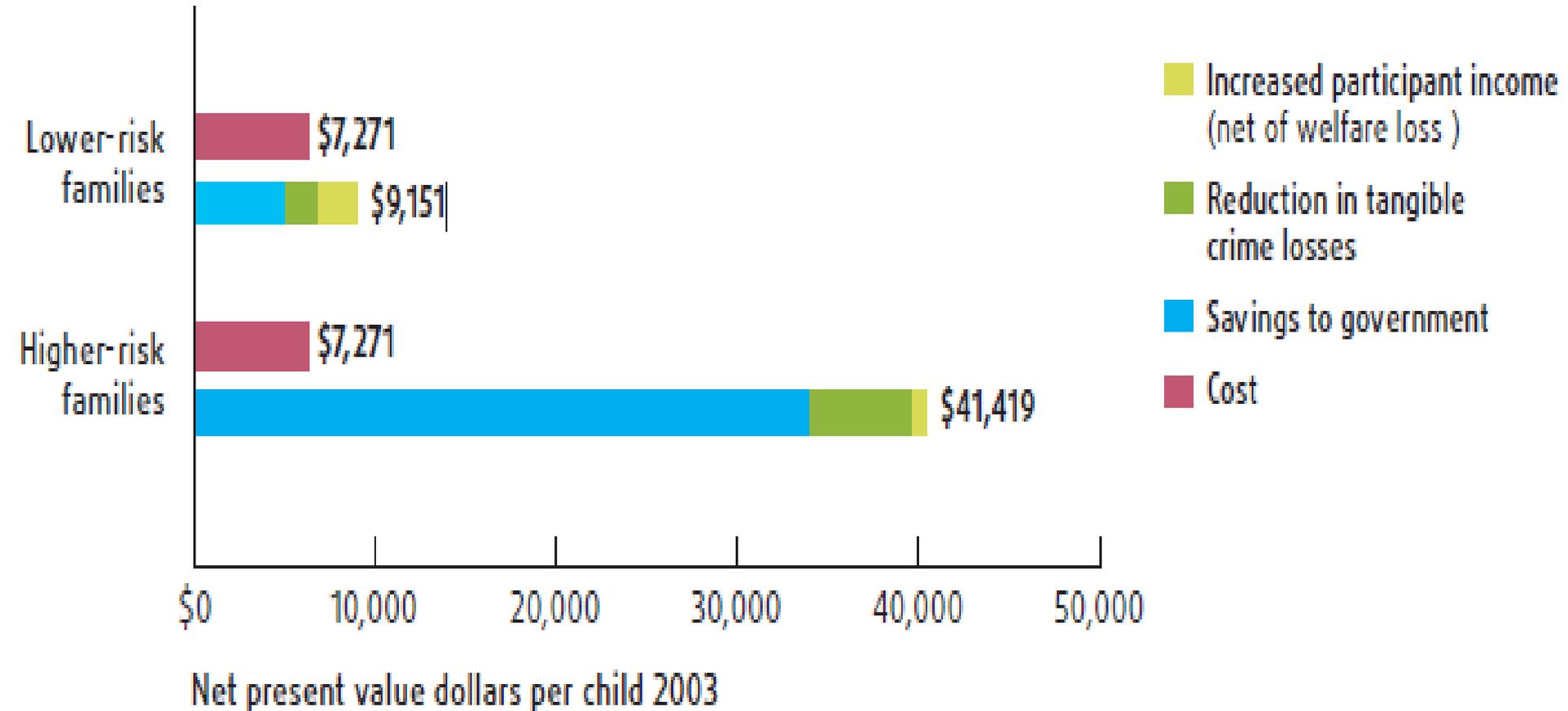
Home Visiting

- Nurse-Family Partnership
- Family Spirit: evidence in AI communities
- Minding the Baby: Yale University
 - Significantly lowered the rate of obesity in low SES 2-yr olds (19.7% control vs. 3.3% intervention)
 - Among Hispanic children, less likely to be overweight or obese (OR=0.32)

Pediatrics 2018;141(2):e20171076

- Tribal Communities
 - MIECHV: ACA funds, 3% set-aside for Tribes
 - Funds 26 Tribal communities, including EBCI
 - Many Tribes implementing with other funds
 - Because of evidence, SDPI funds can be used

Monetary Benefits



Source: 2005 RAND Corporation Study

Family Spirit Impact: Pregnancy to Age 3

Parenting

- Increased maternal knowledge^{1,2,3,4}
- Increased parent self-efficacy^{3,4}
- Reduced parent stress^{2,4}
- Improved home safety attitudes³

Mothers' Outcomes

- Decreased depression.^{1,2,4}
- Decreased substance use⁴
- Fewer risky behaviors^{3,4}

Child Outcomes

- Fewer social, emotional and behavior problems through age 3.^{2, 3, 4}
- Lower clinical risk of behavior problems over life course⁴



Decreased Externalizing,
Internalizing and Dysregulation

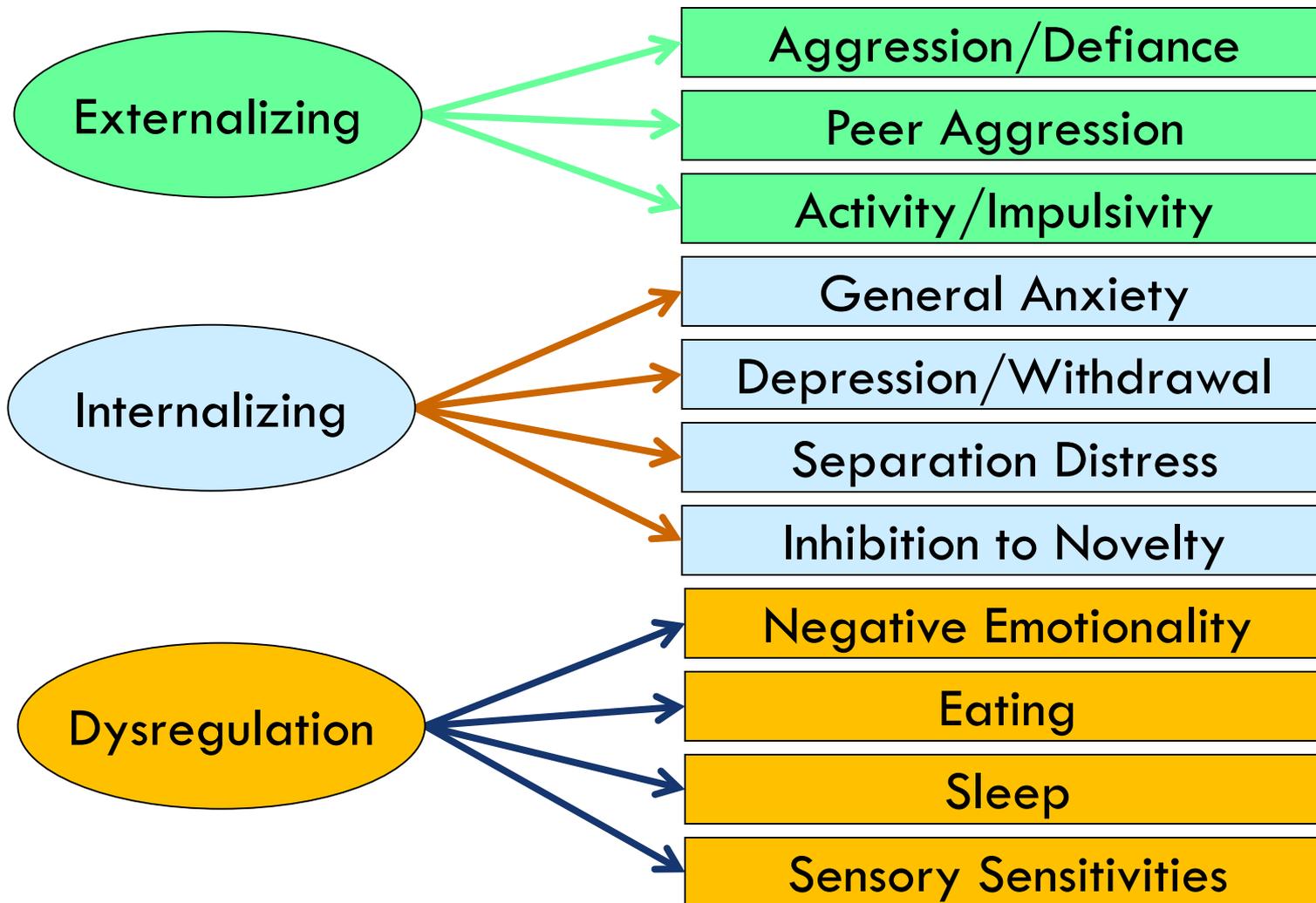
1 Barlow A, Varipatis-Baker E, Speakman K, et al *Arch Pediatr Adolesc Med.* 2006; 160:1101-1107

2 Walkup J, Barlow A, Mullany B, et al. *Journal of the American Academy of Child and Adolescent Psychiatry.* June 2009.

3 Barlow A, Mullany B, Neault N, et al. *American Journal of Psychiatry.* January 2013.

4 Barlow A, Mullany B, Neault N, et al. *American Journal of Psychiatry.*, February 2015.

ITSEA Problem Domains and Subscales within Domains





Quality Child Care: “Early Life Investments Substantially Boost Adult Health”

Carolina Abecedarian Project

- 4 cohorts of disadvantaged children born 1972-77
 - Intervention provided from birth to age 5 years
- Intervention:
 - Level of language, emotional regulation, cognitive skills
 - Caregiving/supervised play
 - Nutrition: 2 meals and a snack at childcare center
 - Primary pediatric care

In their mid-30s: lower prevalence of CVD and metabolic disease risk factors including blood pressure, A1C, obesity; better HDL-cholesterol



Food Insecurity

- **Diet quality** associated with weight gain even if calories restricted
 - Overeating, ↓ physical activity as *consequences* of poor diet quality, stress
JAMA 2014;311(21):2167-2168
- Prevalence of **overweight** in women ↑'s as food insecurity ↑
J Nutr 2001;131:1738-1745
- **Pregnancy:** food insecurity associated with pre-pregnancy obesity, ↑ pregnancy weight gain, and gestational diabetes
Am Diet Assoc 2010;110:692-701
- ↑ Risk for poor blood sugar control
Diabetes Care 2012;35:233-238
- **42%** of households below poverty level are food insecure
 - as are **21%** of all households with **children**
NEJM 2010;363:6-9
- Screen for food insecurity and connect people to food resources
 - Food Insecurity Assessment Tool on IHS Division of Diabetes website

Food Insecurity Assessment Tool and Resource List

To help your patients and clients improve their health, it is important to understand food insecurity and provide them with resources to get more healthy food.

When patients/clients and their children cannot get enough healthy food, they have food insecurity. They:

- Are at greater risk for being emotionally distressed.
- Eat less expensive foods which are often unhealthy.
- Have little choice over what kinds of food to buy or receive for free, making it difficult or impossible to eat balanced meals.
- Have periods when they don't eat, then overeat when food is available. If they have diabetes, this makes it very difficult to manage blood sugar.
- Have a greater risk for being overweight or obese.
- Are more likely to get diseases like diabetes.

To help your patients/clients lessen food insecurity, take these three steps:

1. Read each statement* and ask your client if the statement is often true, sometimes true, rarely true, or never true.
 - Within the past 12 months, we worried whether our food would run out before we got money to buy more. Often True Sometimes True Rarely True Never True
 - Within the past 12 months, the food we bought just didn't last and we didn't have money to get more. Often True Sometimes True Rarely True Never True
2. If your client responds "often true" or "sometimes true" to either statement, they likely have food insecurity. Help them get more food by filling out the list of resources (see next page) and giving it to them.

You can also fill out the list, make copies, and leave them in waiting rooms and other areas for community members to pick up.
3. Advocate for nourishing foods in your community. Take steps to increase the availability of nutritious, affordable food.

* Hager ER, Quigg AM, Black MM, Coleman SM, Heeren T, Rose-Jacobs R, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010 Jul 1; 126(1):26-32.



Where to Get Food Assistance in This Community

Community Name: _____ Date: _____

Not having enough food for yourself and your family is stressful. Lack of good food makes it difficult to provide nutritious meals that help children grow and adults stay healthy. The thought of not having enough food can make you worry.

There are resources to help. If you need food assistance, please don't wait to contact the programs on this list. They can help you get the food you need for yourself and your family.*

Program Name	Contact Name	Contact Number	Other Important Information (Location, Who Can Qualify, Hours, etc.)
SNAP - Supplemental Nutrition Assistance (Food Stamps)			
Food Distribution (Commodities)			
Women, Infants, and Children (WIC)			
School Lunch and Breakfast Program			
Summer Food Service Program for Children			
Senior Center			
Meals on Wheels			
Tribal Food Program			
Farmers Markets			
Community Gardens			
Food Bank / Food Pantry			
"Mobile Grocery Store" Truck			
Church / Place of Worship			
Social Services			

*Check with the program to see if you qualify to get food.



Produced by the IHS Division of Diabetes Treatment and Prevention, 2015. To print this, go to www.ihs.gov/diabetes and search **Food Insecurity** using "exact match" on the Education Materials and Resources (Online Catalog) webpage.



Key Points

- Childhood obesity is a complex issue
- There is limited evidence for interventions that are both safe and effective, especially in younger children
- Interventions worth pursuing:
 - Breastfeeding
 - Home Visiting
 - Child Care/Head Start
 - Educate parents about screen time, physical activity, high calorie beverages
 - Food Insecurity
- Tribes are ideally positioned to implement community-wide, interwoven, comprehensive interventions

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Oklahoma City Convention Center

Diabetes in Indian Country Conference

IHS, Tribal, and Urban clinicians, community health providers, and SDPI grantees will:

- ▶ **LEARN** the latest information and earn CME/CE credits*
- ▶ **NETWORK** with other grantees and clinicians
- ▶ **SHARE** best practices
- ▶ **SHOWCASE** their successful work in AI/AN communities

*ACCREDITATION: The Indian Health Service (IHS) Clinical Support Center is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The Indian Health Service Clinical Support Center is accredited with distinction as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.



More info coming soon. Visit diabetesinindiancountry.com