

Building the Foundations of Child Health: Addressing the Triple Threat of Obesity, Food Insecurity and Hunger

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Objectives

- Understand factors contributing to childhood obesity and food insecurity and their effect on child health
- Understand the role of health professionals, health systems and community in advocacy
- Mobilize the pediatric health professional community to a convergence of thinking and action to improve child nutrition

FOUNDATIONS OF HEALTH: GOAL FOR EVERY CHILD

- **Sound, appropriate nutrition**
 - Health-promoting food intake, eating habits beginning with mother's pre-conception nutritional status
- **Stable, responsive environment of relationships**
 - Consistent, nurturing, protective interactions with adults that enhance learning, help develop adaptive capacities that promote well-regulated stress response systems
- **Safe, supportive physical, chemical and built environments**
 - Provide places for children that are free from toxins, allow active, safe exploration without fear, offer families opportunities to exercise, make social connections



developingchild.harvard.edu/files/5012/8706/2947/inbrief-health.gif

Threats to the Foundations of Child Health: National



- **Diet quality**
 - Children ages 2-17 who meet federal diet quality standards: **50%**
- **Obesity**
 - Children ages 6-17 who have obesity: **18%**
- **Activity limitation**
 - Children 5-17 with activity limitation resulting from one or more chronic health conditions **9%**
- **Food Insecurity**
 - Children 6-10 living in food insecure homes: **21%**

Children's Nutritional Needs

- **“an adequate diet for children...one that contains an appropriate density of nutrients, is sufficiently diverse that it supplies adequate but not excessive amounts of nutrition, is palatable and culturally acceptable, affordable and available year round and overall supports normal growth and development.”**

◦ Allen L, Causes of Nutrition Related Public Health Problems of Children : Available Diet J Ped Gastr Nutr 2006 43 S8-S12

Double Burden

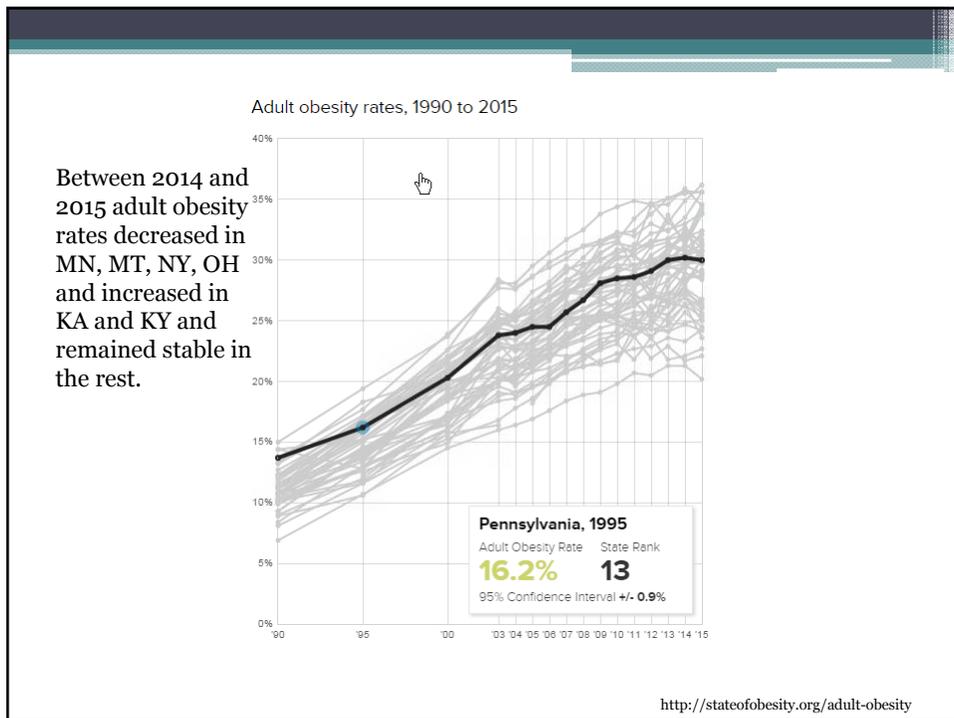
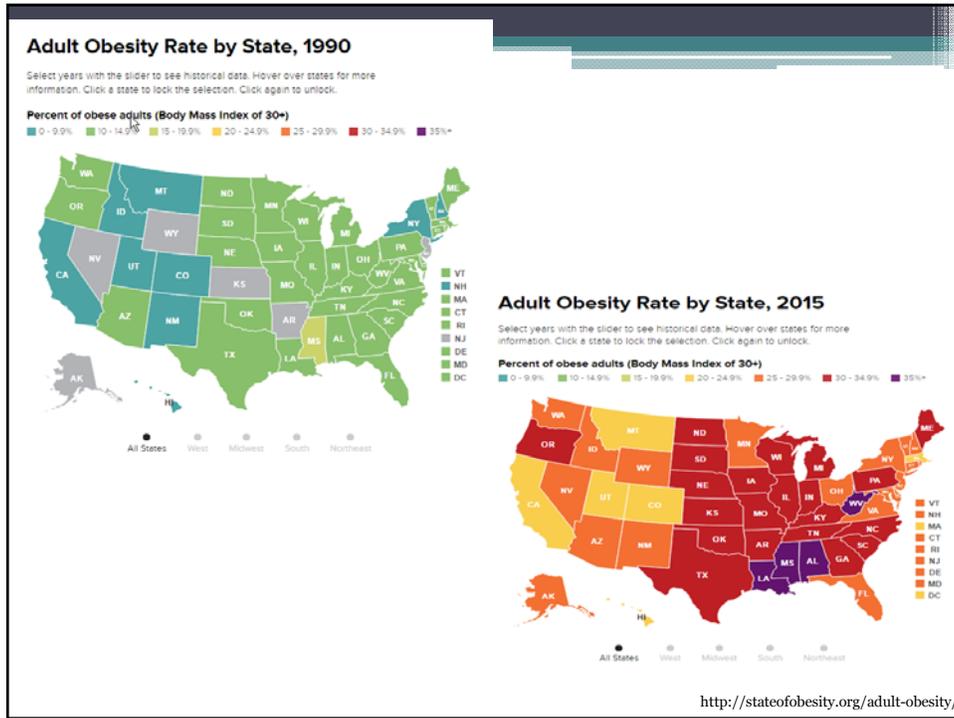
- Obesity and undernutrition have been seen as separate and sometime opposing entities.
- However these two conditions coexist globally, nationally and locally and even within families and individuals
- The dual burden of under and overnutrition occurring simultaneously within a population is referred to as the double burden of malnutrition .

◦ **Chopra, M. From apartheid to globalization: Health and social change in South Africa. *HygieaInternationalis*, 2004.4(1): 153–174.**

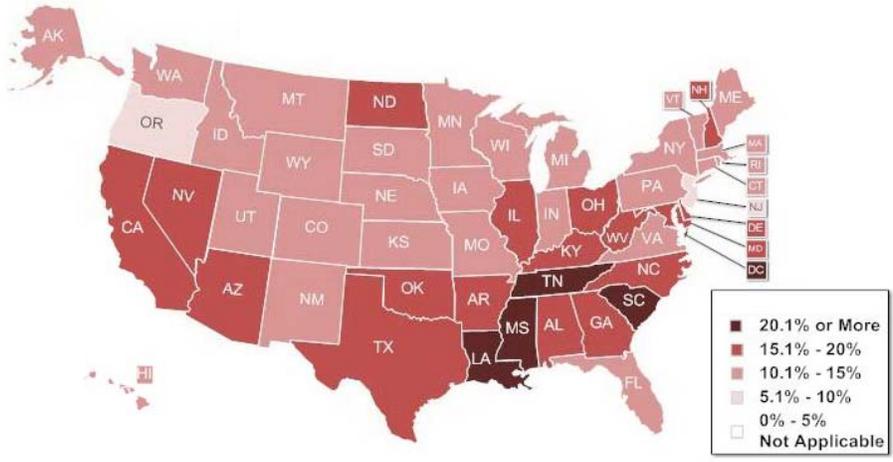
Food Insecurity and Obesity

- Today, however, the picture of food insecurity is increasingly an overweight or obese child consuming a poor-quality diet
- Highest rates of obesity are found in people with the lowest incomes
 - Among poor populations, 7 times as many children have obesity as are underweight
 - Coleman-Jensen A, Nord M, Andrews M, Carlson S. *Household Food Security in the United States in 2011*. Washington, DC: US Dept of Agriculture; September 2012. Economic Research Service report ERR-141. <http://www.ers.usda.gov/media/884525/err141.pdf>
- The challenge for low-income families in today's modern food environment is not obtaining enough food, but rather having dependable access to high-quality food
 - An estimated 16.7 million youth younger than 18 years do not consistently know when, or how adequate, their next meal will be
 - Kursmark M, Weitzman M. Recent findings concerning childhood food insecurity. *Curr Opin Clin Nutr Metab Care*. 2009;12(3):310-316
[PubMed](#) | [Link to Article](#)

Obesity

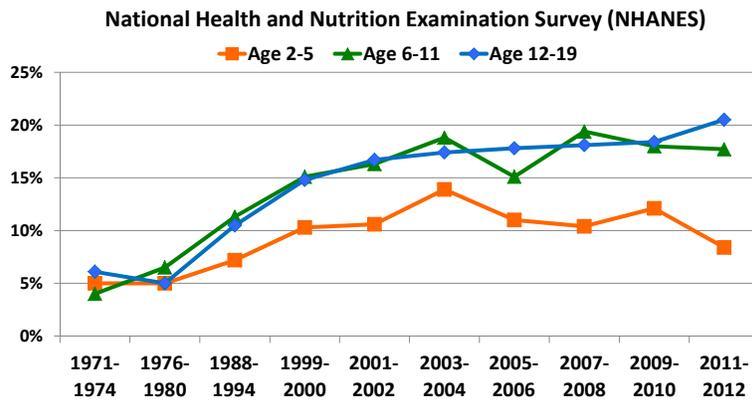


Percentage of Children with Obesity by State 2011



<http://www.ncsl.org/research/health/childhood-obesity-trends-state-rates.aspx>

Prevalence of Obesity Among U.S. Children and Adolescents (Aged 2-19)



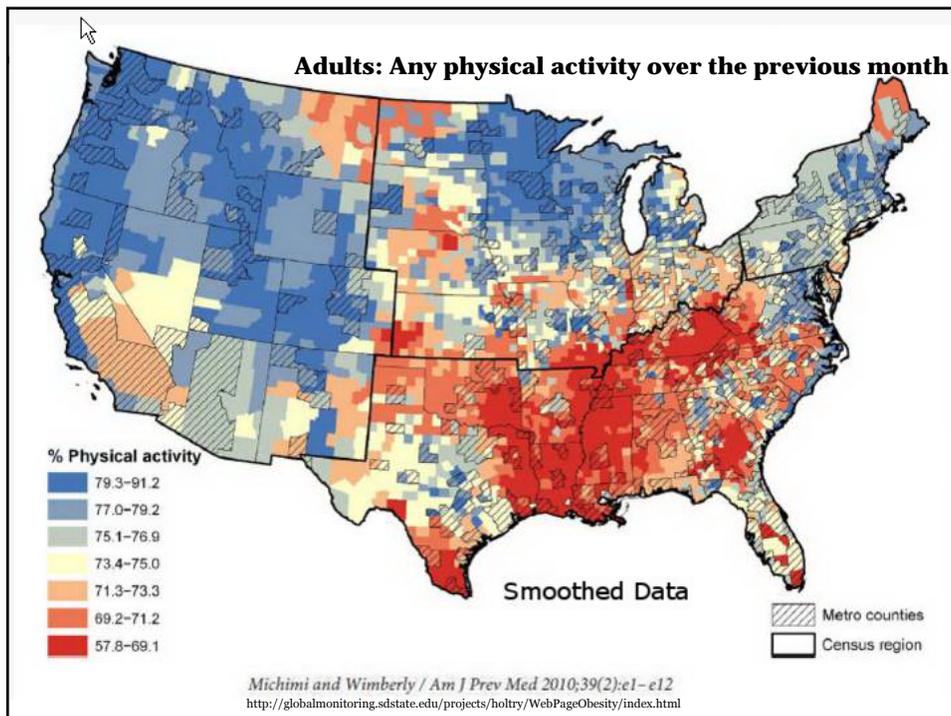
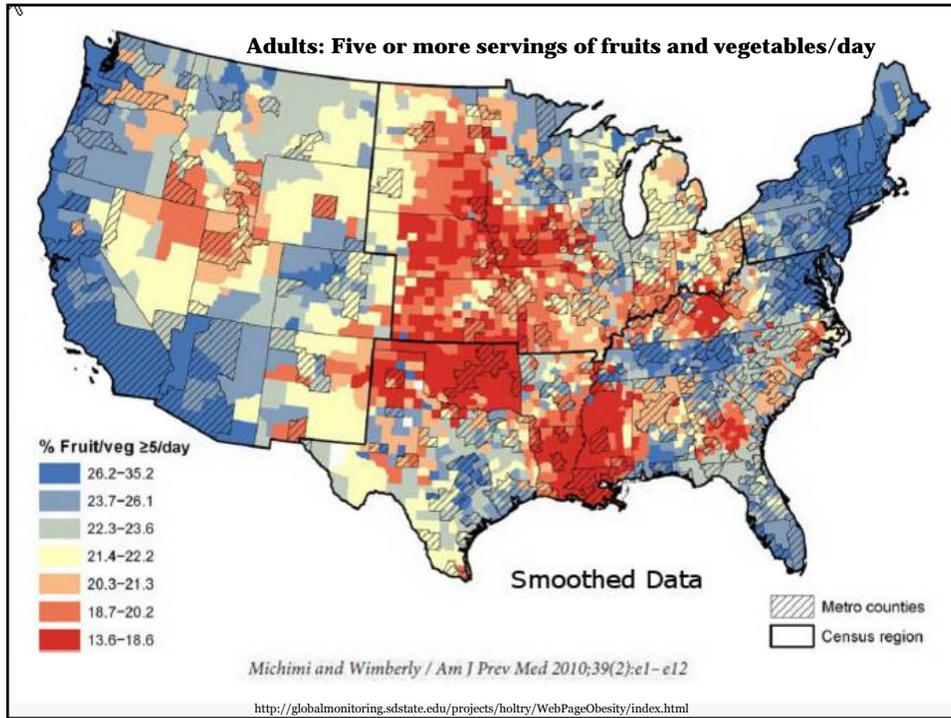
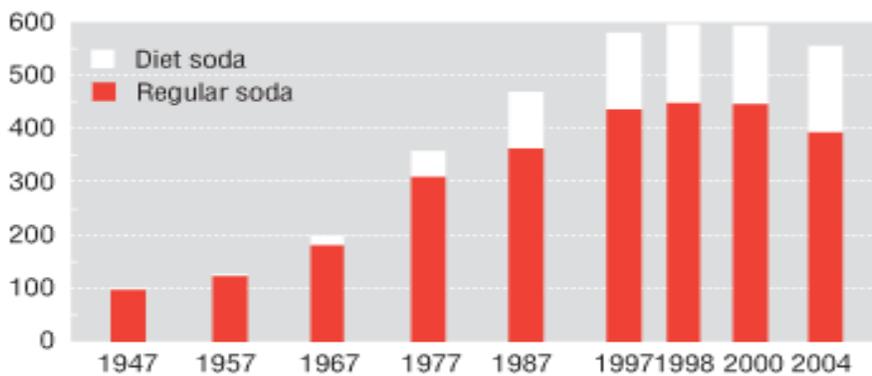


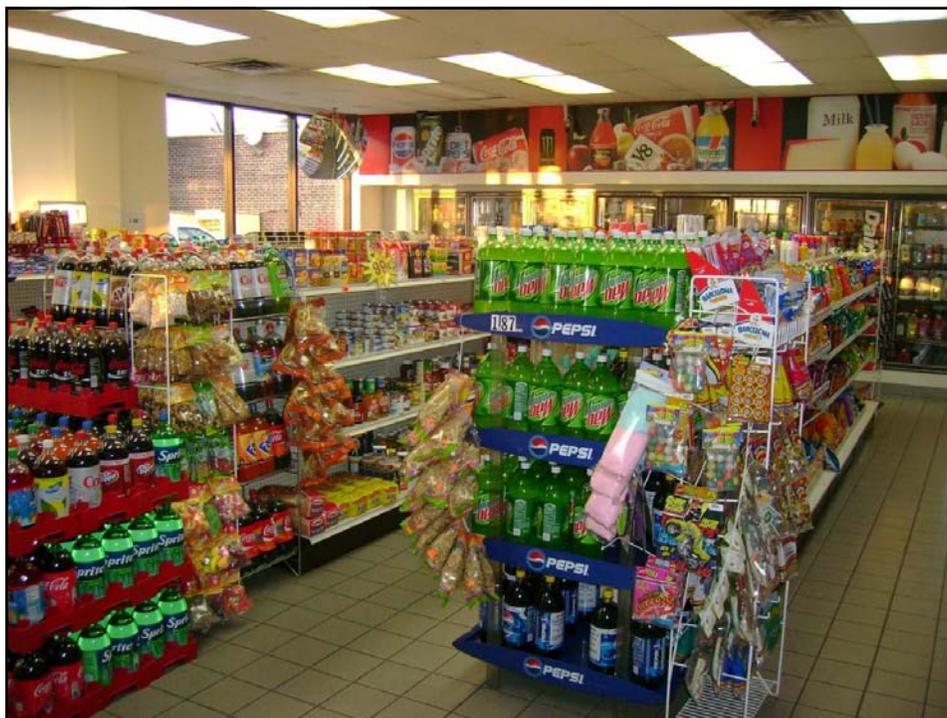
Figure 1
Annual soft drink production in the United States
(12-oz. cans/person)



Sources: USDA Economic Research Service (1947–87); Beverage Digest (1997–2004).

450 12oz soda/person in one year

140kcal/soda = 63,000 kcal/year= 170kcal/day = 16lbs /year





18

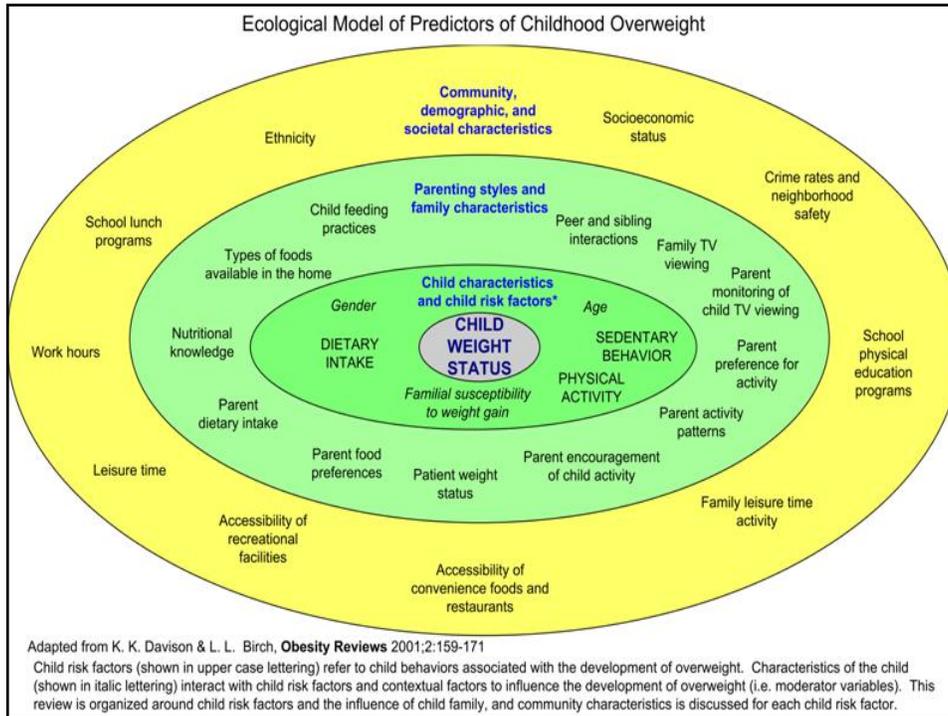
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CHILDHOOD WEIGHT

Health Consequences of Childhood Obesity

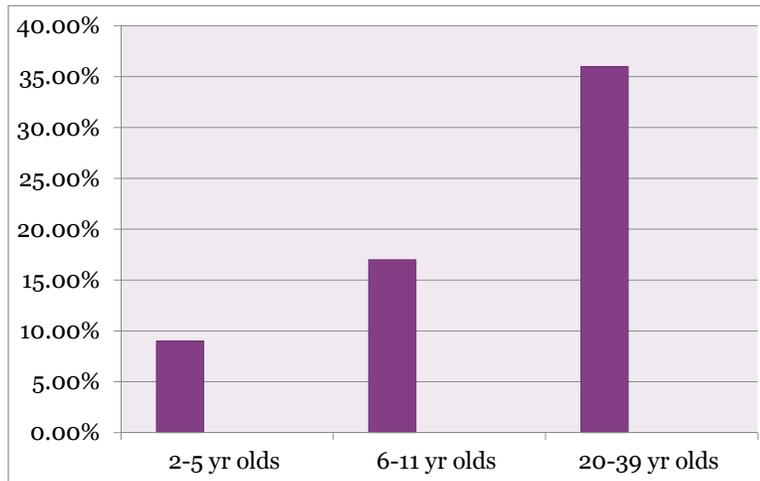
Burden of non communicable disease

Obesity related comorbidities

- Type 2 diabetes
- Hypertension
- Nonalcoholic fatty liver disease
- Dyslipidemia
- Upper Airway Obstruction
- Sleep Apnea Syndrome
- Blount's Disease
- Polycystic ovary syndrome
- Obesity related emergencies
- Depression/anxiety



Obesity Prevalence by Age NHANES 2011-2014



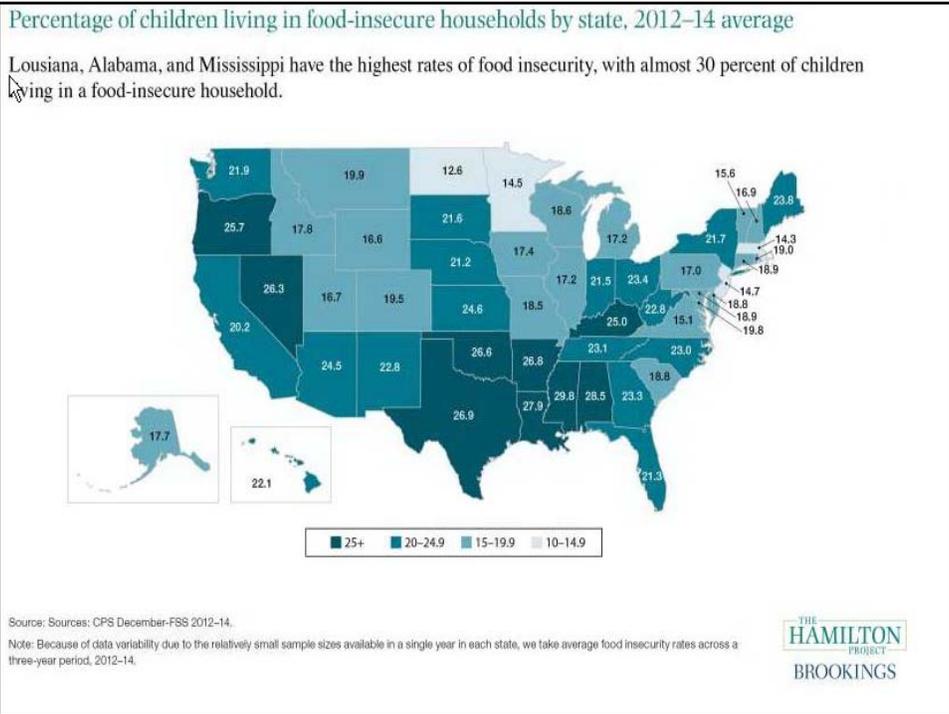
Food insecurity

Food Insecurity

- "the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways."
- "Very low food security," the most severe level measured by the survey, is characterized by irregular meals and inadequate food intake, as determined by caregivers
 - U.S. Department of Agriculture
<http://www.childtrends.org/?indicators=food-insecurity#sthash.VXI2ws3z.dpuf>

Food Insecurity

- 2013, 21% (> 1 in 5) U.S. children lived in households that were food-insecure at some point during the year
- 1% experienced the most severe level of need, where food intake is reduced and regular eating patterns are disrupted
 - <http://www.childtrends.org/?indicators=food-insecurity#sthash.VXI2ws3z.dpuf>



49 MILLION INDIVIDUALS ARE FOOD INSECURE
16 MILLION OF THEM ARE CHILDREN

WE ESTIMATED FOOD INSECURITY FOR ALL **3,143 COUNTIES** IN THE UNITED STATES

KEY FOOD INSECURITY DRIVERS OVER THE PAST DECADE*

- +3.3% POVERTY**
- +1.6% UNEMPLOYMENT**
- 2.6% HOMEOWNERSHIP**

FOOD BUDGET SHORTFALL FOR FOOD-INSECURE INDIVIDUALS

FOOD-INSECURE INDIVIDUALS REPORT NEEDING AN ADDITIONAL FOOD BUDGET OF **\$2.26 PER PERSON PER DAY**

THAT'S **\$15.82 PER WEEK**

OR **\$68.74 PER MONTH**

Annual cost burden of hunger in the US \$167.5 billion.

Costs associated with charity, chronic illness, psychosocial dysfunction, diminished learning and economic productivity

Shepard D et al Hunger in America Suffering we all pay for
2011 www.americanprogress.org/wpcontent/uploads/issues/2011/10/pdf/hungerpaper.pdf

* Coleman-Jensen, A., M. Nord & A. Singh. Household Food Security in the United States in 2010. USDA Economic Research Service, 2010. Print.
† Percent African American and percent Hispanic are also key drivers of food insecurity.
‡ U.S. Census Bureau, Current Population Survey, 2002-12 and Bureau of Labor Statistics, Current Population Survey, 2009-10.

<http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2012/2012-mapthemealgap-exec-summary.pdf>

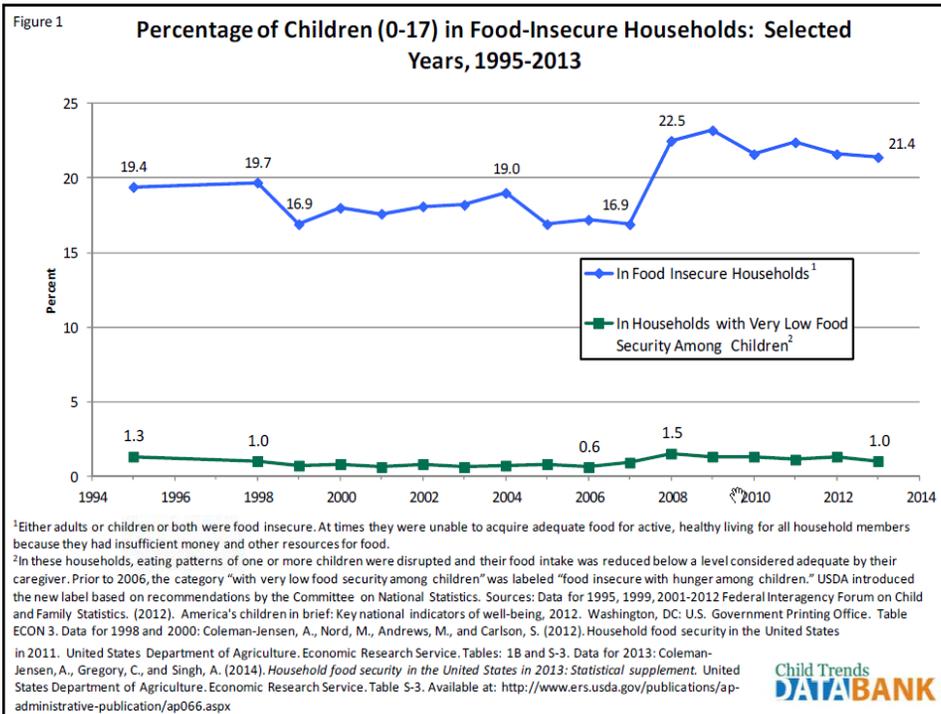
Food Insecurity in Households

Percentage of households reporting each indicator of food insecurity, by food security status, 2011

Indicator	Food secure	Low food security	Very low food security
Worried food would run out	~10%	~85%	~95%
Food bought did not last	~10%	~80%	~90%
Could not afford balanced meal	~10%	~75%	~85%
Cut size of meal or skipped meal	~10%	~65%	~80%
Cut or skipped meal in 3+ months	~10%	~55%	~75%
Ate less than felt should	~10%	~50%	~70%
Hungry but did not eat	~10%	~45%	~65%
Lost weight	~10%	~40%	~60%
Did not eat whole day	~10%	~35%	~55%
Did not eat whole day, 3+ months	~10%	~30%	~50%

Source: Calculated by USDA, Economic Research Service using data from the December 2011 Current Population Survey Food Security Supplement.

Coleman-Jensen et al Household Food Security in the United States in 2011 ERR-141 USDA Economic Research Service, 9/12.



Households with higher rates of food insecurity

- Households with children (20.6%)
 - Households with children under 6 yr (21.9%)
- Households with incomes <185% poverty (34.5%)
 - Incomes near or below poverty line
- Headed by single women (36.9%) or single man (24.9%)
 - Black (25.9%) or Hispanic (26.2%) households
- Large cities (17.7%) and rural areas (15.4%)
- Only 57% participated in SNAP, WIC, School lunch
 - Most food insecure households had very low food security several days each month for 7 mo/year
 - Food secure households spent 24% more for food (including SNAP)
 - Coleman-Jensen et al Household Food Security in the United States in 2011 ERR-141 USDA Economic Research Service, 9/12.

Child Health and Food Insecurity

- Parent-reported poorer health and developmental risk
 - More frequent stomach aches, headaches, colds, hospitalizations, anemia and chronic conditions
 - More anxiety, depression, school difficulties
 - Nord M, Food insecurity in households with children: Prevalence, severity, and household characteristics. 2009 USDA, Economic Research Service www.ers.usda.gov/Publications/EIB56/
 - More difficulty with interpersonal skills, self control, attentiveness, flexibility and persistence
 - Howard LL, Does food insecurity at home affect non cognitive performance at school? A longitudinal analysis of elementary school classroom behavior. 2010 Economics of Education Review 20, 157-176
- Infants more likely to have insecure attachments and perform more poorly on cognitive assessments
 - Zaslow M et al Food security during infancy; Implications for attachment and mental proficiency in toddlerhood. 2009 Maternal and Child Health Journal 13(1) 66-80



Hunger and Chronic Illness

- Children who experienced hunger more likely to have poorer health
- Repeated episodes of hunger are particularly toxic
- Multiple episodes of hunger associated with a higher likelihood of chronic conditions and of asthma
- The number of episodes of hunger that children experience is related to their health as they grow older
 - Kirkpatrick SI, McIntyre L, Potestio ML. Child hunger and long-term adverse consequences for health. Arch Pediatr Adolesc Med 2010;164:754-62.

How it feels

✓ School age children are aware and distressed

May develop their own strategies for reducing food intake including choosing to eat less than they want

Fram MS, Frongillo EA, Jones SJ. Et al. Children are aware of food insecurity and take responsibility for managing food resources. *J Nutr* 2011;141(6) 114-119.

✓ Teens express worry, anxiety or sadness, shame or fear of being labeled poor, feeling of having no choice

Connell CL, Lofton KL, Yadrick K, Rehner TA. Children's experiences of food insecurity can assist in understanding its effect on their wellbeing. *J Nutr* 2005;135(7)1684-1690



The Challenge



In 2010, more than one third of children and adolescents had overweight or obesity.



Childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years.



Increased risk factors for comorbidities such as cardiovascular disease and diabetes.

\$127 million



Annual hospital costs related to obesity and comorbidities such as hypertension, type 2 diabetes, liver disease, and sleep apnea.



One in five children lives in a food insecure home.



The US is falling short of meeting child food security targets.



Children with food insecurity are in poorer health

\$167.5 billion



Cost of hunger charity, chronic illness, psychosocial dysfunction, diminished learning and economic productivity.

We've Improved our Practice



American Academy of Pediatrics
**Institute for Healthy
 Childhood Weight**
 WHERE LIFELONG RESULTS BEGIN

- Calculate and classify BMI
- Screen for obesity related comorbidities
- Focus on stepwise family based change for children with obesity
- Prevention 5210
- Focus on early feeding and activity
- Foster parenting skills



<https://ihcw.aap.org/>

Community Based Treatment MEND Study

- A multicomponent community-based childhood obesity intervention
- 116 children with obesity randomly assigned to intervention or waiting list control
 - Parents and children attended eighteen 2-h group educational and physical activity sessions held twice weekly in sports centers and schools, followed by a 12-week free family swimming pass
 - Children were followed up 12 months
 - Intervention group had a reduced waist circumference z-score (-0.37; $P < 0.0001$) and BMI z-score (-0.24; $P < 0.0001$) at 6 months when compared to the controls
 - Significant between-group differences were also observed in cardiovascular fitness, physical activity, sedentary behaviors, and self-esteem
 - Mean attendance for the MEND Program was 86%
 - 12 months, children in the intervention group had reduced their waist and BMI z-scores by 0.47 ($P < 0.0001$) and 0.23 ($P < 0.0001$)
 - Benefits in cardiovascular fitness, physical activity levels, and self-esteem were sustained
 - High-attendance rates suggest that families found this intensive community-based intervention acceptable.

◦ Sacher PM, Kolotourou M, Chadwick PM, Cole TJ, Lawson MS, Lucas A, Singhal A. Randomized controlled trial of the MEND program: a family-based community intervention for childhood obesity Obesity (Silver Spring). 2010 Feb;18 Suppl 1:S62-8.

FOOD INSECURITY IN PEDIATRIC PRACTICE



POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN

Promoting Food Security for All Children

ISSUED IN COOPERATION WITH: COMMUNITY PEDIATRIC EDUCATION IN NUTRITION

abstract

Screening for food insecurity in children is a public health priority because children who live in households that are food insecure, even if the household is not poor, are likely to be less healthy than those more likely to be hospitalized more frequently. Lack of adequate healthy food can impair a child's ability to concentrate and perform well in school and is linked to higher levels of behavioral and emotional problems from preschool through adolescence. Food insecurity can affect children in any community, not only traditionally underserved areas. Pediatricians can play a central role in screening and identifying children at risk for food insecurity and in connecting families with needed community resources. Pediatricians should also advocate for local and federal policies that support access to adequate healthy food for an active and healthy life for all children and their families.

INTRODUCTION

In 2013, 17.2 million US households, or 14.3% of all households and 27% of all children, met the US Department of Agriculture (USDA) definition of a food-insecure household, one in which "access to adequate food is limited by a lack of money or other resources."¹ Households with children are nearly twice as likely to be food insecure as households without children. In 2013, 7.5 million American families with children lacked consistent access to adequate, nutritious food. The crisis becomes even more pressing for families facing severe economic hardship. In 2013, almost 60% of all food-insecure households had incomes below 100% of the federal poverty threshold, the income eligibility cutoff for many child nutrition programs. The federal poverty threshold for an average family of 4 people in 2013 was \$23,054. 10% of this threshold amount is \$2,305, but the federal poverty level is a calculation of economic hardship, and the amount to provide basic needs for a family of 4 often far exceeds this amount. Because 30% of food-insecure households live below this level, it is clear the problem is not related solely to poverty.

The demographic of food-insecure households extends beyond the areas of concentrated urban poverty and into suburban and rural America, where

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- Screen for food insecurity
 - “Within the past 12 months we worried whether our food would run out before we got money to buy more”
 - “Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.”
- Be familiar with and refer positive screens to community resources that address food insecurity (WIC, SNAP, school meals, summer feeding sites, food pantries, etc.)
- Advocate to protect and expand access to and funding for these programs at all levels of government

Food Insecurity in Primary Care

- The Keeping Infants Nourished and Developing (KIND) program
 - Collaboration between the primary care network and the foodbank
 - The goal was to address FI in households with infants via provision of supplemental infant formula, tailored education, and connection to clinic and community resources or public benefit programs
- An on-site physician, social worker, and dietician collaborated to define KIND eligibility criteria.
- Families receiving KIND were significantly more likely to report risks relating to parental mental health, housing, benefits, and domestic violence, (highest-risk patients).
- KIND may have served as a “connector” between these high-risk households and primary care
 - Patients receiving KIND were more likely to have complete preventive services (eg, lead, developmental screening) and 5+ well-infant visits in the first 14 months, more likely to be linked to interventions poised to address multiple and potentially interrelated concerns (eg, social work)

Forging a Pediatric Primary Care-Community Partnership to Support Food-Insecure Families Andrew F. Beck, Adrienne W. Henize, Robert S. Kohn, Kurt L. Reiber, John J. Young, and Melissa D. Klein *Pediatrics* 2014; 134:2 e504-e511; published ahead of print July 21, 2014. doi:10.1542/peds.2013-3845

WHO'S HUNGRY



YOU CAN'T TELL BY LOOKING
1 in 4 California children go to bed hungry.
Join your American Academy of Pediatrics in asking
"Who's Hungry" and universally screening for food insecurity.

Use this quick, validated tool;

- Within the past 12 months, we worried whether our food would run out before we got money to buy more.
- Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.

AAPCA1.ORG

BREAKFAST CAN MAKE THE DIFFERENCE



<http://www.thedp.com/article/2016/02/nutrition-science-major>



<http://crossinology.com/a-new-take-on-school-lunch-nutrition-boost-your-Childs-brain-power/>

<http://biogenerd.blogspot.com/2013/03/brain-food-nutrition-for-learning-memory.html>

Obesity and Educational Outcomes

- **Increased behavioral problems**
 - **Internalizing problems**
 - low self-esteem, sadness, acting withdrawn
 - **Externalizing problems**
 - arguing, fighting, disobedience
 - **School discipline problems**
 - detentions and suspensions
 - **Problems increasing significantly with increased weight status**
- **School problems increased with child's BMI.**
 - **Repeating a grade**
 - **Low school engagement**
 - **Increased school absence**
- **Exposure to bullying and teasing**

- Davis A, Shera R. Childhood overweight and parents and teacher-reported behavior problems: evidence from a prospective study of kindergarten. *Arch Pediatr Adolesc Med* 2006; 160(10):1408-14.

- Taylor R, Larson R, Shuman W. Associations between obesity and emotional/mental health, development, and physical health conditions in nationally representative sample of US children aged 6 to 11. *Arch Pediatr* 2012; 123(10):1528.

- Shera AM, Laska ML, Lohrke JL, Ross DS, Wright AB, Litovell JI. Documented academic achievement in overweight middle school students. *Obesity (Silver Spring)* 2008; 16(7):1522-1528.

- Wang H, Wang H, Schuchman B, Schuchman L, Baskin RL. Obesity, engagement, and performance in adolescents in inner-city African American children. *J Pediatr Psychol* 2012; 137(10):1147-1155.

- Garcia HG, Singh GK, Brown RE, Williams AV. Educational outcomes associated with childhood obesity in the United States: cross-sectional results from the 2001-2002 National Survey of Children's Health. *The International Journal of Behavioral Nutrition and Physical Activity* 2012; 9(1):101-101.

Hunger/Food Insecurity and School Performance

- **Short-term hunger can adversely affect attention and interest**
 - Levinger B. Nutrition, health and education for all. Education and Development Centre. Newton MA: Education and Development Center, Inc, 1996.
- **Overnight and morning fasting (e.g. skipping breakfast) has been shown to adversely affect performance on cognitive tasks, particularly for children who are nutritionally at risk**
 - Pollitt E. Does breakfast make a difference in school?. *Journal of the American Dietetic Association* 1995;95(10):1134.
- **Children who live in food insecure households**
 - **Worse performance in math and reading**
 - **Loss of school days because of illness**
 - **Repeated grades**
 - **Lower engagement in school**
 - **Lower academic achievement scores in reading, math, and science**

- Jyoti DP, Frongillo EA, Jones SJ. Food insecurity affects school children's academic performance, weight gain, and social skills. *J Nutr*. 2005;135(2):283-9.

- Alaimo K, Olson CM, Frongillo EA Jr. Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development. *Pediatrics*. 2001;108(1):44-53.

- Murphy JM, Wehler CA, Pagano ME, Little M, Kleinman RE, Jellinek MS. Relationship between hunger and psychosocial functioning in low-income American children. *J Am Acad Child Adolesc Psychiatry*. 1998; 37(2):163-70.

- Ashabi G. Household food insecurity and children's school engagement. *J Child Poverty*. 2005;11(1): 3-17.

- Tolbert Kimbro and Justin T. Denney. Transitions Into Food Insecurity Associated With Behavioral Problems And Worse Health Affairs, 34, no. 11 (2015):1949-1955.

Food Insecurity and Mental Health

- Child hunger predictor of depression and suicidal ideation during late adolescence and young adulthood
- Food insecurity linked with higher rates of adolescent mood, behavior and substance abuse disorders
- Food insecurity early in life can weaken infants' attachments to parents, which may negatively affect children's mental health later in life
 - McIntyre L, Williams JVA, Lavorato DH, Patten S. Depression and suicide ideation in late adolescence and early adulthood are an outcome of child hunger. *J Affect Disord* 2013;150:123-9
 - McLaughlin KA, Green JG, Alegria M, et al. Food insecurity and mental disorders in a national sample of U.S. adolescents. *J Am Acad Child Adolesc Psychiatry* 2012;51:1293-303
 - Zaslow M, Bronte-Tinkew J, Capps R, et al. Food security during infancy: Implications for attachment and mental proficiency in toddlerhood. *Mat Child Health J* 2009;13:66-80.

Coexistence of Food insecurity and obesity

Food insecure and low-income people are especially vulnerable to obesity due to the additional risk factors associated with poverty, including:

- Limited resources
- Lack of access to healthy, affordable foods
- Fewer opportunities for physical activity
- Cycles of food deprivation and overeating
- High levels of stress
- Greater exposure to marketing of obesity-promoting products
- Limited access to health care

frac_brief_understanding_the_connections.pdf

Limited Resources and Lack of Access to Healthy Affordable Foods

- Lack of full service grocery stores and farmer's markets
 - Reliance on corner/convenience stores
- Greater density of fast food
 - Larson N et al Neighborhood environments, disparities in access to healthy foods in the US 2009 Am J Prev Med 36(1) 74-81
- Cost differential between healthy (nutrient dense) and unhealthy food (energy dense/nutrient poor)
- Poorer quality healthy food
 - Andreyeva T et al Availability and prices of foods across neighborhoods The case of New Haven CN 2008 Health Affairs 27(5) 1381-1388

Greater Exposure to Obesity Promoting Products

- Fast food, sugary beverages, television shows, video games
 - Kumanyika S et al Targeting interventions for low income and ethnic populations 2006 Future of Children 16(1) 187-207

High Levels of Stress

- Financial and emotional stress
 - Food insecurity, low wage work, difficulty paying bills, inadequate and long distance transportation, neighborhood violence
 - Block JP et al Psychological stress and change in weight among US adults 2009 Am J Epid 170 (2) 181-192

Cycles of Food Deprivation and Overeating

- Metabolic consequences of cycles of over and under consumption
 - Alaimo K et al Low family income and food insufficiency in relation to overweight in U S Children is there a paradox? 2001 Arch Ped Adol Med 155(10)1161-1167
 - Dietz W Does hunger cause obesity? Pediatric 95(5) 766-767
- Maternal food restriction leading to obesity
 - McIntyre L et al Do Low income mothers compromise their nutrition to feed their children? 2003 Canadian Med Assoc J 168. 686-691

Fewer Opportunities for Physical Activity

- Fewer parks, green spaces, bike paths, and recreational facilities
 - Gordon-Larson P, et al Inequalities in the built environment underlies key health disparities in physical activity and obesity 2006 Pediatrics 117(2) 417-424
- Crime, traffic and unsafe play spaces
 - Gordon-Larson P et al Barriers to physical activity, qualitative data on caregivers perspective and practice Am J Prev Med 27(3) 218-223
- Expense and transportation to participate in sports
 - Duke J et al Physical activity levels among children 9-13 years United States 2002 MMWR 52(33) 785-788
- Low income students spend less time being active in PE and have less recess
 - Barros R et al School recess and group classroom behavior 2009 Pediatrics 123(2) 431-436

Participation in Federal Nutrition Assistance Programs

Program	Number of Children Served in 2014
Supplemental Nutrition Assistance Program (SNAP)	20.5 million
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	6.3 million
Child and Adult Care Food Program (CACFP)	3.6 million
Free or reduced-price school lunch	21.7 million
Free or reduced-price school breakfast	11.5 million
Summer feeding programs	2.7 million

Participation in Federal food programs

Participation of food-insecure households in selected Federal food and nutrition assistance programs, 2011

Program	Share of food-insecure households that participated in the program during the previous 30 days ^{1,2}	Share of households with very low food security that participated in the program during the previous 30 days ^{1,2}
	<i>Percent</i>	
SNAP ³	40.1	42.5
Free or reduced-price school lunch	32.2	26.5
WIC ⁴	11.2	8.6
Any of the three programs	57.2	56.0
None of the three programs	42.8	44.0

Coleman-Jensen et al Household Food Security in the United States in 2011. ERR-141 USDA Economic Research Service, 9/12.

Strategies to improve nutrition

Correcting Basic Undernutrition

- Education
- Dietary modification
- Food provision
- Supplementation and fortification
- Consensus needs to be built around approaches to scale up coverage and delivery strategies to reduce disparities and provide equitable access.
- Strategies to address food insecurity and poverty alleviation are key

Obesity prevention and Treatment

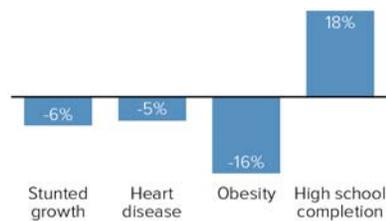
- Adult and child health education
- Family Systems change
- Lifestyle modification
- Interaction with clinical care
- Access to healthy affordable food
- Opportunity and access to physical activity

³ Bhutta ZA, Salam RA, Das JK. Meeting the challenges of micronutrient malnutrition in the developing world. Br Med Bull. 2013;106:7-17

Health Effects of Federal Nutrition Programs

Children With Access to SNAP Fare Better in Adulthood

Percentage-point change in outcomes for adults who received SNAP as children, compared to adults who did not receive SNAP as children



Source: Hoynes, Schanzenbach, and Almond, "Long Run Impacts of Childhood Access to the Safety Net," National Bureau of Economic Research, November 2012.

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WIC

- ✓ Healthier Babies and Lower Infant Mortality
- ✓ Higher Vaccination Rates and Improved Access to Health Care
- ✓ Breastfeeding Promotion
- ✓ Improves Children's Educational Prospects

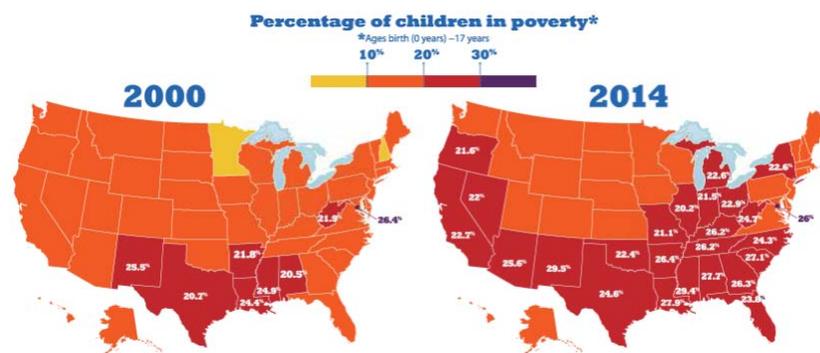
Prenatal/Early Childhood WIC Exposure

- Study of children with and without WIC participation and early cognitive development and success in school.
 - Age 2 Bayley Short Form-Research Edition (BSF-R)
 - Age 11 Woodcock-Johnson Revised reading and math achievement tests
- Could account for +/- prenatal WIC but couldn't tell if all children with prenatal WIC had early childhood WIC although evidence suggests most of them do participate in early childhood.
 - *Jackson MI, Early Childhood WIC Participation, Cognitive Development and Academic Achievement. Soc Sci Med. 2015 February ; 126: 145-153. doi:10.1016/j.socscimed.2014.12.018*

Anti-Poverty Effects of Federal Nutrition Programs

- Nutrition assistance through free- or reduced-price school lunches reduced the child poverty rate by 1.1% in 2014.
- SNAP has lifted about 2.1 million out of poverty. Without SNAP benefits alone child poverty would have increased by 2.8% in 2014.
- WIC supports sound nutrition during critical periods of cognitive development to mitigate the detrimental effects of poverty.

United States Child Poverty Rates



<http://www.aft.org/growth-child-poverty-mapped-county-50-states>

Cochrane Review of effect of school meals in developed countries

- **School meals are most effective for those most in need**
 - Improvement in school attendance
 - Improvement in concentration with school breakfast
 - Improvement in pro social playground activities
 - Breakfast short term improvement on morning testing

• Kristjansson B, Petticrew M, MacDonald B, et al. School feeding for improving the physical and psychosocial health of disadvantaged students (Review). Cochrane Database Syst Rev 2007;(1):CD004676. doi:10.1002/14651858.CD004676.pub2

Neighborhoods

Correcting Basic Undernutrition

- Improve transportation to healthy food sources
- Decrease unhealthy food options
- Lower cost of healthy foods
- Alter existing shopping patterns

Obesity prevention and treatment

- Ability to walk to school
- Child friendly neighborhoods
- Neighborhood culture (active or inactive)
- Faith based initiatives
- Access to health care providers and services

• Sadler et al Int J Env Res Pub Health 2013 Aug 10(8) 3325-2246

Employers/Workplace

Correcting Basic Undernutrition

- Increase income eligibility for food assistance programs
- Increase adult full time employment
- Increase eligibility for households with disabled adult
- Increase high school completion for adults in household
 - <http://www.ers.usda.gov/media/1120651/eib-113.pdf>

Obesity prevention and treatment

- Health benefits
- Wellness programs
- Healthier work environments
- Activity opportunities
- Marketing of healthier choices

Schools and Childcare

Correcting Basic Undernutrition

- Increase participation in school lunch program
- Increase breakfast in class
- Increase nutritional quality of after school snack
- Consider alternate venues for summer feeding programs
- Identify infants with undernutrition

Obesity prevention and treatment

- Vending machine snacks and beverages
- School meals
- Physical education
- Fund raising
- Health education
- Built environment
- Time constraints

Philadelphia Schools 2006-7 to 2012-13

- **Prevalence of childhood obesity and severe obesity among Philadelphia school children declined by 6.3% and 13.9, respectively**
 - Reductions were larger among boys than girls, among African Americans and Asians than among whites and Hispanics, and in the first 4 years than in the final 3 years
 - After initial declines, the prevalence of obesity increased significantly among Hispanic girls and girls in grades K to 5 over the final 3 years.
- **Philadelphia school district reforms in the 1990s and 2000s**
 - Nutrition education in approximately 200 schools with high rates of poverty
 - Greater access to free or reduced-price meals through the National School Lunch Program and the School Breakfast Program
 - Comprehensive nutrition standards for foods offered in cafeterias and vending machines and at fundraisers, and shifts toward healthier items (low-fat milk) and cooking practices (removal of kitchen fryers)
- **Since 2010, the Philadelphia Depart. Public Health and its partners have implemented Get Healthy Philly**
 - Creation of Wellness Councils in 170 public schools serving 100,000 students to ensure that health-promoting policies — such as healthy food fundraisers and classroom movement breaks — are put into practice
 - Citywide food and fitness standards for 300 after-school sites serving 20,000 low-income children
 - 650 healthy corner stores offering more fruits, vegetables, and low-fat milk
 - Safe Routes to School bike and pedestrian education affecting 50,000 second-graders and fifth-graders
 - Mass-media campaign highlighting links between sugary drink consumption, weight gain, and diabetes in children
- **Between 2007 and 2013**
 - Soda consumption among Philadelphia teens declined by 24%
 - Fruit and vegetable consumption, physical activity, and screen time among Philadelphia teens did not change over this same time period

Robbins JM, Malloy G, Wagner A, Baehler JW. Prevalence, Disparities, and Trends in Obesity and Severe Obesity Among Students in the School District of Philadelphia, Pennsylvania, 2006–2013. *Prev Chronic Dis* 2015;12:150185. DOI: <http://dx.doi.org/10.5888/pcd12.150185>

Population Level

- **State and National policy**
 - **Healthy Hunger Free Kids Act**
 - **WIC**
 - **SNAP**
 - **Head Start**

Families

- Understanding the families relationship with their environment at the population, community, workplace and school is part of putting the obesity and food insecurity puzzle together.
- ? How can we look at family function to enhance the work of connection and empowerment ?

Characteristics of Effective (Health Care) Systems can this be applied to families?

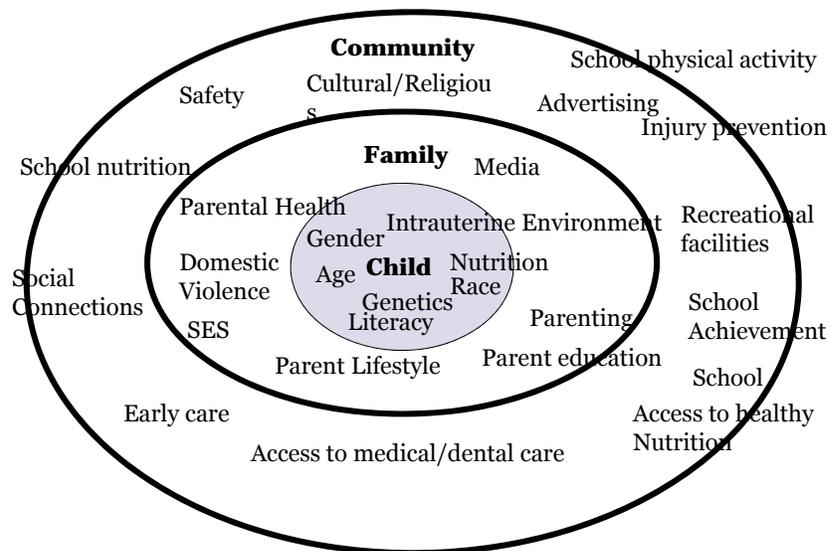
- Integration of information
- Measurement
- Interdependence of the care team (family)
- Supportiveness of the larger system
- Constancy of purpose
- Connection to the community
- Alignment of role and training
- Investment in improvement
 - Mohr J, Batalden PB Improving safety on the front lines: the role of clinical microsystems. *Quality Saf Health Care* 2002;11:45-50.

Importance of Community Characteristics

- Community may be bounded by geography or identity but for collective action needs;
- Membership
 - sense of identity and belonging
- Common symbol systems
 - similar language, rituals, and ceremonies
- Shared values and norms
- Mutual influence
 - community members have influence and are influenced by each another
- Shared needs and commitment to meeting them
- Shared emotional connection
 - members share common history, experiences, and mutual support

▫ Israel B, Checkoway B, Schulz A, Zimmerman M. Health Education and Community Empowerment: Conceptualizing and Measuring Perceptions of Individual, Organizational, and Community Control; Health Education Quarterly, Vol 21(2); Summer 1994.

Foundations of Child Health Rooted in the Socioecological Model



FOUNDATIONS OF HEALTH: GOAL FOR EVERY CHILD

- **Sound, appropriate nutrition**
 - Health-promoting food intake, eating habits beginning with mother's pre-conception nutritional status
- **Stable, responsive environment of relationships**
 - Consistent, nurturing, protective interactions with adults that enhance learning, help develop adaptive capacities that promote well-regulated stress response systems
- **Safe, supportive physical, chemical and built environments**
 - Provide places for children that are free from toxins, allow active, safe exploration without fear, offer families opportunities to exercise, make social connections



developingchild.harvard.edu/files/5012/8706/2947/inbrief-health.gif