

# Epidemiologic Risk Factors for Childhood Obesity: Implications for Future Obesity and Caries Prevention Research

Session I: Overview of the Science

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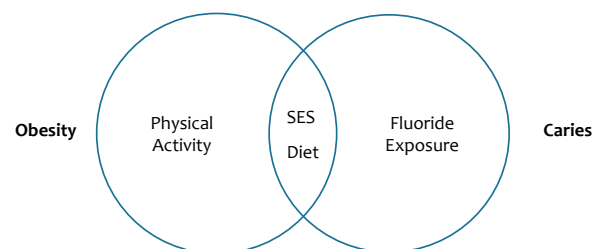
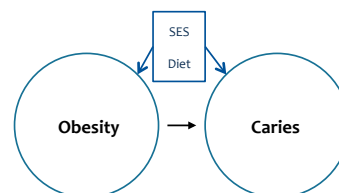
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## Childhood Obesity in the U.S.

- \* U.S. Centers for Disease Control and Prevention
  - \* Obesity BMI  $\geq$  95<sup>th</sup> percentile
  - \* Overweight BMI 85<sup>th</sup> to 95<sup>th</sup> percentile
- \* 1/3 U.S. children: **17%** obesity, **16%** overweight
- \* 2- to 3- fold increase since 1970s
- \* Rates have remained constant
- \* Persistent race and income inequalities
- \* Physical and psychosocial consequences over the life course

## Obesity and Caries

- \* Is obesity associated with caries?
  - \* Theoretical mechanism
  - \* Highly prevalent childhood diseases
  - \* Is this the right question?
- \* Common risk factors: reframing the issue

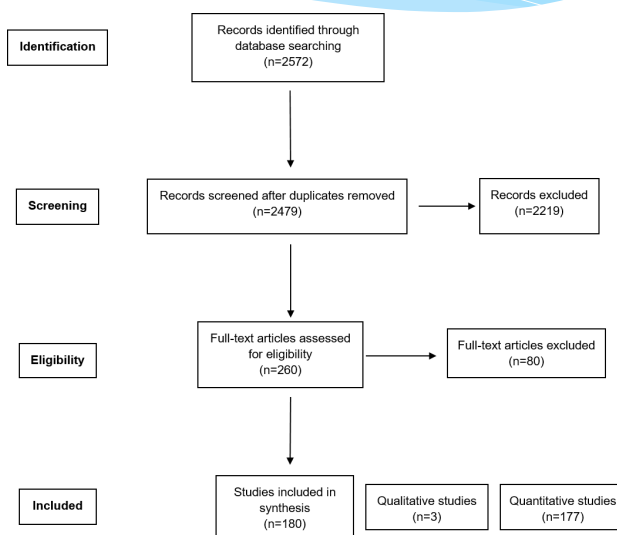


## Study Goals

- \* Identify **modifiable** and **non-modifiable** risk factors for childhood obesity
- \* Develop a **conceptual common risk factors model** for obesity and caries
- \* Outline **strategies for dental professionals** to develop programs that address obesity and caries

## Methods

- \* Scoping review of obesity risk factors (<12 years)
- \* PubMed and Embase
- \* N=180 studies
- \* Qualitative content analytic methods to organize risk factors into domains
- \* Domains as modifiable or non-modifiable
- \* ID common risk factors

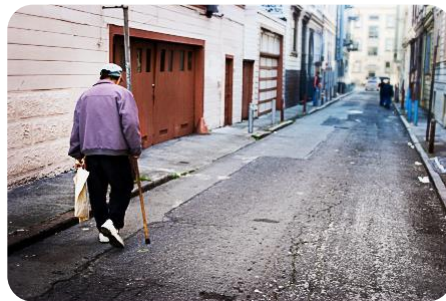


## Biological, Developmental, Sociodemographic

- \* Genes and epigenetics
    - \* AMY1
    - \* rs1421085
    - \* GRK4 + high sodium intake
  - \* Minority race/ethnicity
  - \* Low income
  - \* Low parent education
  - \* Parent unemployment
  - \* Public school
  - \* Food insecurity
- SES
- \* Developmental disabilities
  - \* Grandparent caretaker
  - \* Early onset puberty

## Cultural and Community Factors

- \* No English home
- \* Increased acculturation
- \* Minority neighborhood
- \* Neighborhood poverty



## Behavioral – Diet

### Ages 0-2 Years

- \* No breastfeeding, shorter duration
- \* High protein infant formula
- \* Finishing bottle content
- \* Early introduction of solid foods
- \* Sugar sweetened beverages (SSBs)

### Ages 2-12 Years

- \* Increased appetite, eating speed, number of meals
- \* Increased sodium, carbohydrates, protein, cholesterol, triglycerides, caffeine, SSBs, total energy
- \* Low vegetable and fruit intake
- \* Restrictive feeding practices
- \* Fewer family meals, less engagement during meals
- \* Watching TV during meals
- \* Skipping breakfast
- \* Eating out, fast food consumption
- \* Snacking

## Behavioral – Physical Activity and Weight

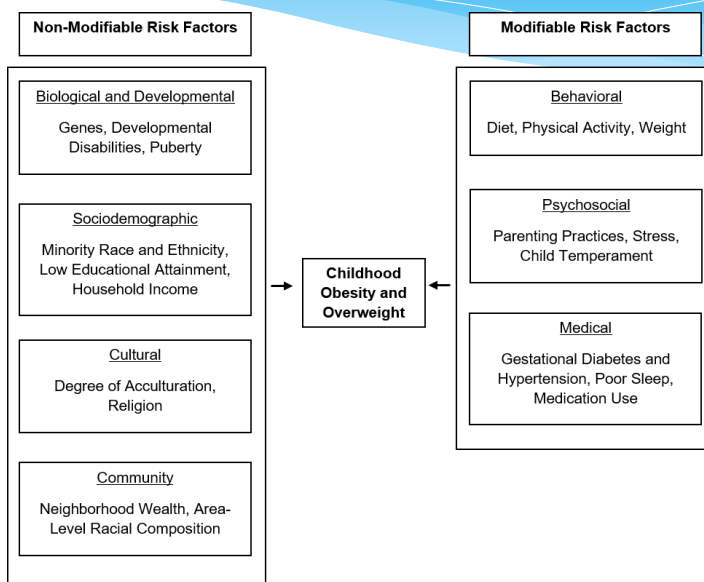
- \* Lower activity
- \* Sedentary lifestyle
- \* No involvement in sports
- \* Increased TV viewing
- \* Computer and videogaming
- \* Parental obesity and overweight
- \* Increased pregnancy weight
- \* Greater birthweight, rapid weight gain during infancy



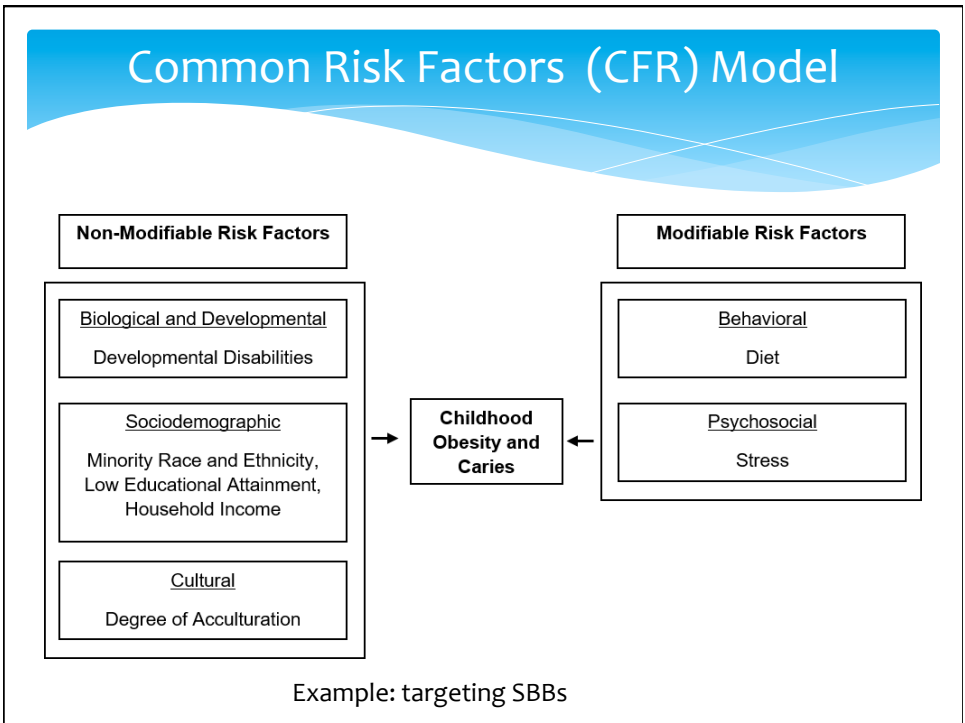
## Psychosocial and Medical

- \* Maternal stress
- \* Social risks (domestic violence, parent incarceration, substance abuse)
- \* Childcare (age at entry, daycare, primary caregiver)
- \* Child temperament (low inhibitory control, poor self-regulation)
- \* Gestational hypertension
- \* Antibiotic exposure
- \* Maternal depression, diabetes
- \* Caesarian section
- \* Caregiver smoking
- \* Shorter sleep duration

## Conceptual Model on Obesity Risk Factors



# What Can Oral Health Professionals Do?



## Modifiable Risk Factors

- \* Target of interventions
- \* Behavioral interventions
- \* Health behavior change theory
- \* Interdisciplinary teams

**Modifiable Risk Factors**

Behavioral

Diet

Psychosocial

Stress

## Non-Modifiable Risk Factors

**Non-Modifiable Risk Factors**

Biological and Developmental

Developmental Disabilities

Sociodemographic

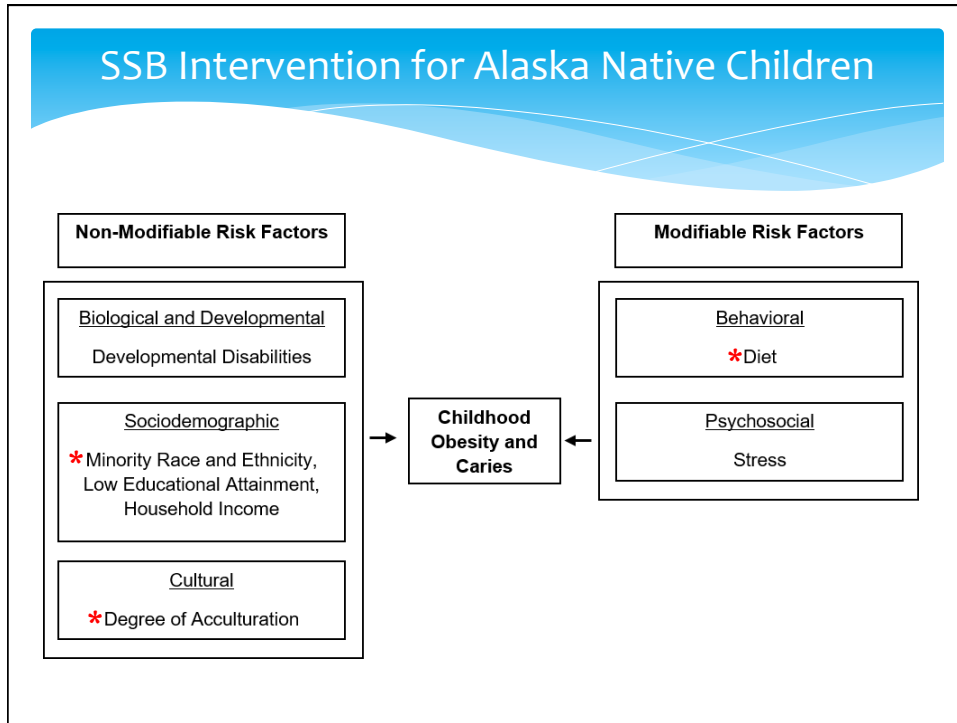
Minority Race and Ethnicity,  
Low Educational Attainment,  
Household Income

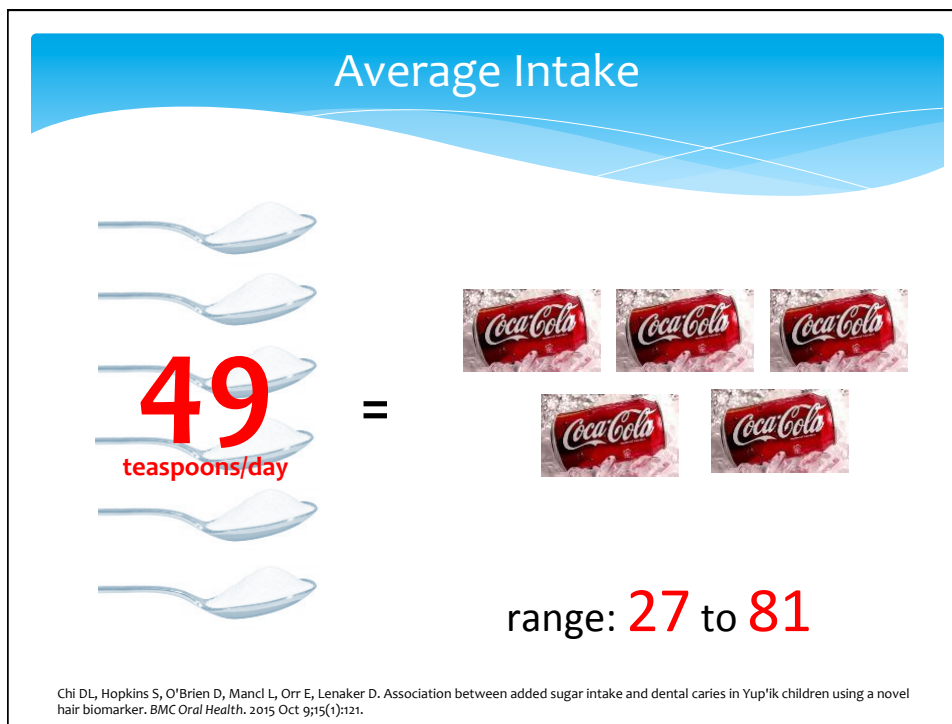
Cultural

Degree of Acculturation

- \* Targeted Interventions: developmental disabilities, race/ethnicity, income
- \* Tailored Methods: acculturation







## The Proposed Intervention

- \* **Individual, Home, and Community-Based** Intervention in Alaska Native Communities (multilevel)
- \* Indigenous Community Health Worker (community-based participatory research)
- \* Target: Self-Efficacy and Health Literacy (behavioral)
- \* Outcomes: Caries and Obesity (common risk factor)

## “Non-Modifiable” Risk Factors

<b>Non-Modifiable Risk Factors</b>
<u>Biological and Developmental</u> Developmental Disabilities
<u>Sociodemographic</u> Minority Race and Ethnicity, Low Educational Attainment, Household Income
<u>Cultural</u> Degree of Acculturation

- \* Long-term modifiability
- \* Health Equity and Social Policies: education, income
- \* Intense debate in poverty literature

## Comprehensive CRF Approach

**Obesity**      **Physical Activity**      **Diet**      **Fluoride Exposure**      **Caries**

Multiple Behaviors  
 Non-Overlapping Risk Factors  
 Complexity, Mechanisms, Cost

## Clinical Implications

- \* Limitations of private practice dental offices: Screening, Brief Intervention, Referral for Treatment (SBIRT)
- \* Developing interdisciplinary models of care within academic settings, community health centers, federally qualified health centers
- \* Home and community-based interventions
- \* Collaborating with community partners

## Study Limitations

- \* Gaps in the model (social factors)
- \* Main effect correlations and causal inference
- \* Relationships among risk factors unspecified

## Take Home Messages

- \* **Common risk factors** associated with childhood obesity and caries
- \* Potential for dental health professionals to work with obesity researchers to develop **targeted and tailored community-based behavioral** interventions
- \* Importance of supporting broader **social policies** to address poverty