

# San Bernardino County Public Health

Baby's Optimal Nutrition with Ultimate Support

BONUS Program



LOMA LINDA UNIVERSITY  
HEALTH



# Breastfeeding and Its Impact on Childhood Obesity

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# Outline

## »Breastfeeding/childhood obesity

1. IDEFICS study
2. National Survey of Children's Health study
3. NHANES study
4. CLASS II study
5. Nordic- systematic review
6. WHO- systematic review

## »Obesity implications and complications in childhood and beyond



# Breastfeeding Research: What Is Known

» Breastfed babies less likely to have:

- ~ Respiratory infections
- ~ Diarrhea
- ~ Constipation
- ~ Ear infections
- ~ Allergies and eczema
- ~ Asthma
- ~ Childhood cancer
- ~ Sudden Infant Death Syndrome



# 1. IDEFICS study

- » Identification and prevention of dietary- and lifestyle-induced health effects in children and infants (IDEFICS) study
- » *Population:* 16,224 children aged 2-9 yrs from Italy, Estonia, Cyprus, Belgium, Sweden, Hungary, Germany and Spain.
- » *Results:*
  - ~ Exclusive breastfeeding for 4-6 months was protective of overweight/obesity when compared with children never exclusively breastfed\*
  - ~ Exclusive breastfeeding for 6 months offered slightly more protection than 4 and 5 months combined\*\*

\*(OR 0.73, 95% CI 0.63, 0.85) ,\*\*(OR 0.71, 95 % CI 0.58, 0.85)



## 2. National Survey of Children's Health

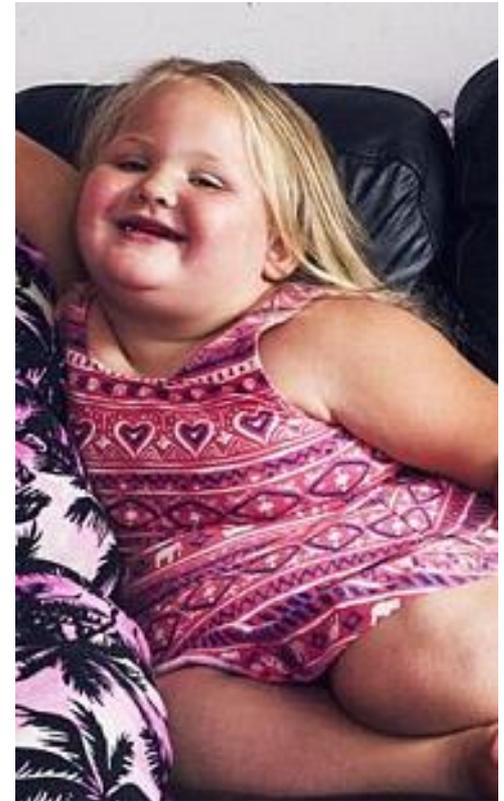
- » Hansstein, 2015, cross-sectional data analysis
- » *Population*: 8207 children ages 2-5 yrs from households in rural and urban US
- » *Measures*: Parent-reported BMI, breastfeeding initiation and duration



## 2. National Survey of Children's Health

### » *Results:*

- ~ At age 2-5 yrs, breastfed children had 8.9% lower probability of being obese compared to children never breastfed\*
- ~ Children breastfed < 3 months had 4.7% higher probability of being obese compared to children breastfed  $\geq$  3 months\*\*



\*( $p < .001$ )\*\*( $p = .013$ )



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## 3. CLASS II Study



- » 2011 Children's Lifestyle and School-performance Study II, a cross-sectional, population based survey
- » *Population:* 5,560 students in Nova Scotia, Canada (age 10-11, 5<sup>th</sup> grade)



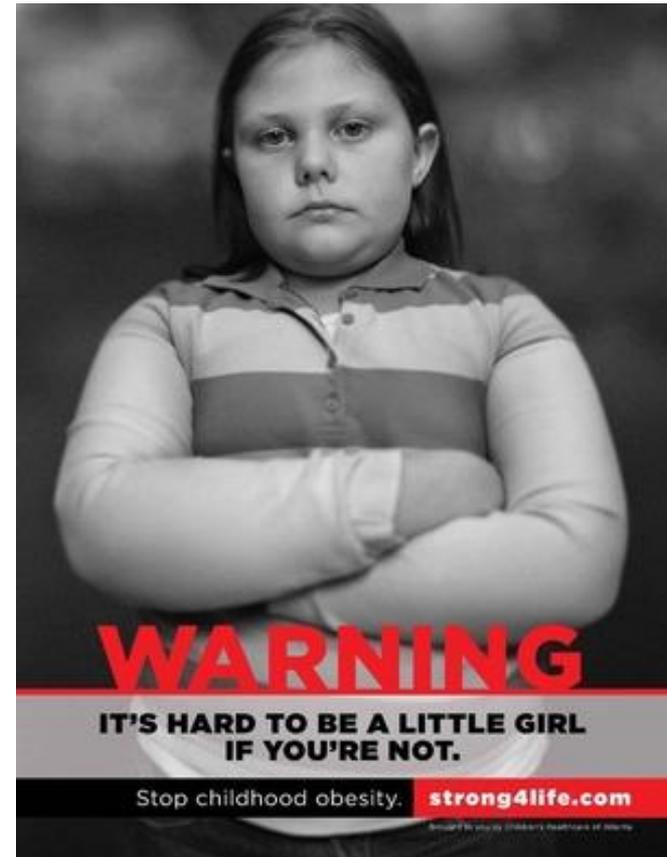
### 3. CLASS II Study

» *Measures:*

- Parent-reported infant feeding behaviors,
- Food frequency questionnaire
- Measured height, weight.

» *Results:* Children formula fed or combination fed for <6 months were more likely to be overweight/obese relative to children only breastfed\*

\*(OR 1.29, 95% CI 1.04-1.60 and OR 1.35, 95% CI 1.09-1.69, respectively)



## 4. NHANES Study

- » Holmes et al 2011 analysis of National Health and Nutrition Examination Survey
- » *Population:* 2568 children
- » *Measures:* Feeding habits for first 4 months of life, BMI percentile at age 2-6 yrs



## 4. NHANES Study

» *Results: at age 2-6 years*

- Exclusive breast feed infants had a lower risk of overweight/obesity
- Combination breast feeding/formula and fully formula-fed infants were at comparable risk of overweight/obesity

» *Factors: Combination feeding*

- Ethnicity - Latino, African-American
- SES - poorer families\*
- Maternal - HS education/non-US birth

\*(P < .0001)



# 5. Nordic Systematic Review

- » Part of 5th revision of Nordic Nutrition Recommendations
- » *Methods:* Systematic literature review of 24 quality assessed papers on growth, overweight, obesity



# 5. Nordic Systematic Review

- » *Grade 1 evidence*: Longer duration of exclusive breastfeeding or any breastfeeding associated with a protective effect against overweight/obesity in childhood/adolescence
- » *Grade 2 evidence*: Exclusive breastfeeding for > 4 months associated with slower weight gain during later infancy compared with those exclusively breastfed for < 4 months
- » *Grade 3 evidence*: Breastfeeding protective against overweight/obesity in adulthood



## 6. WHO review

- » 2007 systematic review of 39 estimates of the effect of breastfeeding on overweight/obesity.
- » *Results:*
  - Breastfed individuals less likely to be overweight/obese\*
    - socioeconomic status, parental anthropometry, age at assessment, year of birth, and study design did not modify the effect of breastfeeding



## 6. WHO Review

### » *Possible biological mechanisms:*

- ~ Lower protein intake and reduced energy metabolism among breastfed infants
- ~ Different hormonal responses to feeding
- ~ Breastfed infants adapt more readily to new foods.



# Obesity's childhood complications

- » Cardio-metabolic risk factors
- » Nonalcoholic fatty liver disease
- » Compromised perceived quality of life
- » Depression
- » Behavioral disorders
- » Lower Self-esteem



# Childhood CVD risk factors

- » *Population:* NHANES data subset of 3,644 children aged 3-6 years
- » *Findings:* Increased BMI and WC associated with elevated CRP levels in African-American children, Latino boys, and non-Latino white girls



# Obese children become obese adults

- » Simmonds, et al 2015 systematic review and meta-analysis, 8 countries, 15 prospective cohort studies
- » *Population: 200,777*
- » *Measures: BMI in child, teen, adults*
- » *Results:*
  - Obese children/teens = 5x more likely obese as adults normal weight peers
  - 55% of obese children->obese teen
  - 80% of obese adolescents->obese adults
  - 70% remain obese over age 30



# Trajectory of childhood obesity

» Childhood obesity associated in adulthood with:

- ~ Obesity (Simmonds et al. 2015)
- ~ Diabetes (Al Mamun et al. 2009)
- ~ Asthma (Burgess et al. 2007)
- ~ Metabolic syndrome (Schmidt et al. 2011)
- ~ Increased left ventricular mass (Tapp et al. 2014)





# Breastfeeding

- » First Food for health
- » Infants will not object
- » Upstream intervention
- » Long term benefits
- » Strike against future adult obesity



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# Gillman et al 2006

- » Aim: To assess the association of breastfeeding with adolescent obesity within sibling sets
- » Population: 5614 sibling sets from cohort of 16,539 U.S. children age 9-14 yrs
- » Measures: Mother-reported duration of breastfeeding, Patient-reported weight and height
- » Results: 6-8% decrease in the odds of overweight for a 3.7-month increment in breastfeeding duration
- » Similar results for within-family and overall analysis

