The Burden of Not Breastfeeding

Effect of Breastfeeding on Chronic Disease

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No Disclosures

Breastfeeding is nutritionally, immunologically, neurologically, endocrinologically, economically, and ecologically superior to formula…

-The Lancet 2016 McFadden et. Al.

Objectives

- List 3 ways in which breastfeeding impacts the health of mothers
- List 3 ways in which breastfeeding impacts the health of infants
- Describe 2 ways in which improving rates of breastfeeding impacts societal health

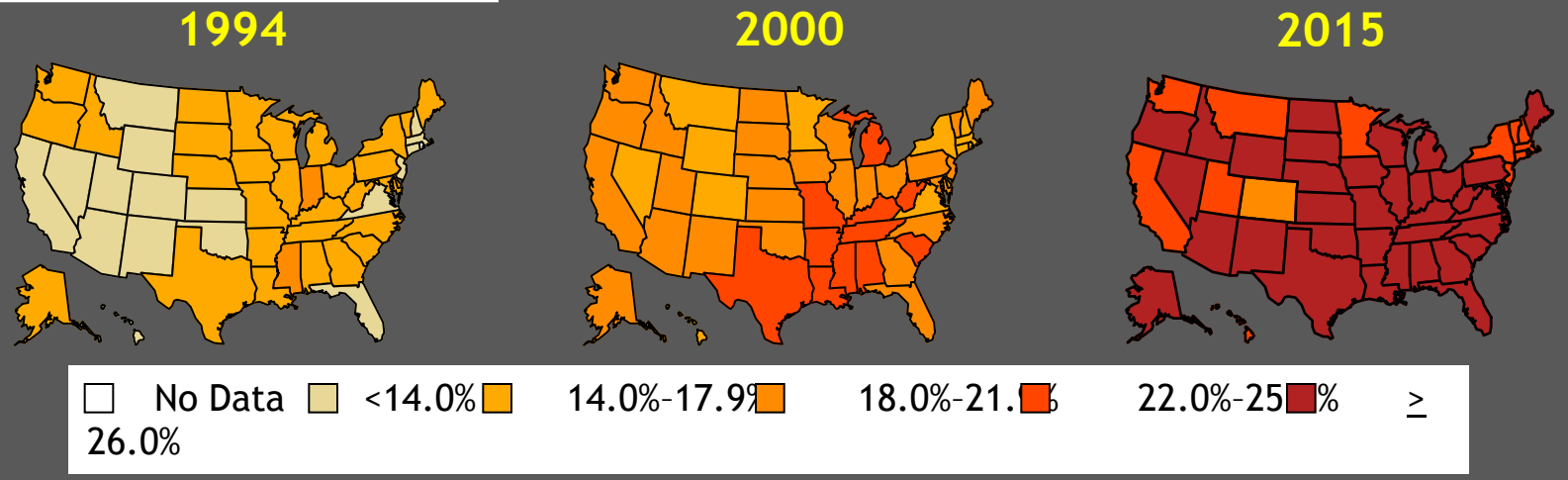
State of Arkansas' Health

- 42nd in nation in diabetes – 11.2% of population
- Top 5 highest obesity rate - >35% of the population
- 3rd highest stroke rate in US - 3.8%
- 3rd highest rate of death related to cardiovascular disease - 223.7 per 100,000

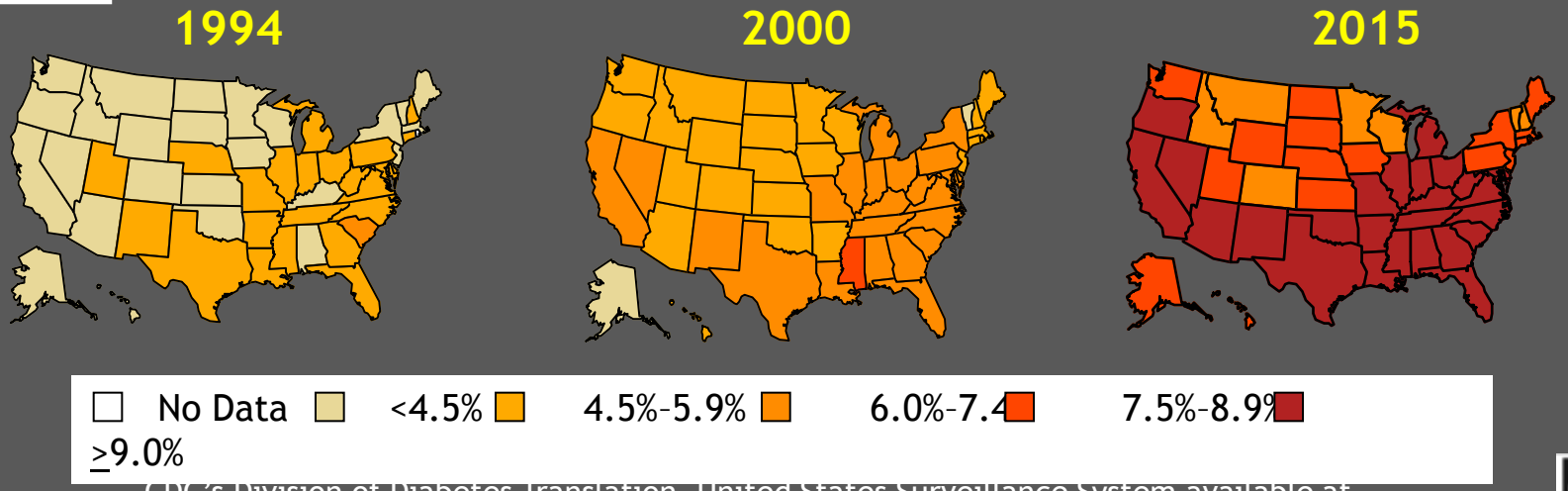
- Arkansas has the 3rd lowest breastfeeding rate

Age-adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults

Obesity (BMI ≥30 kg/m²)



Diabetes



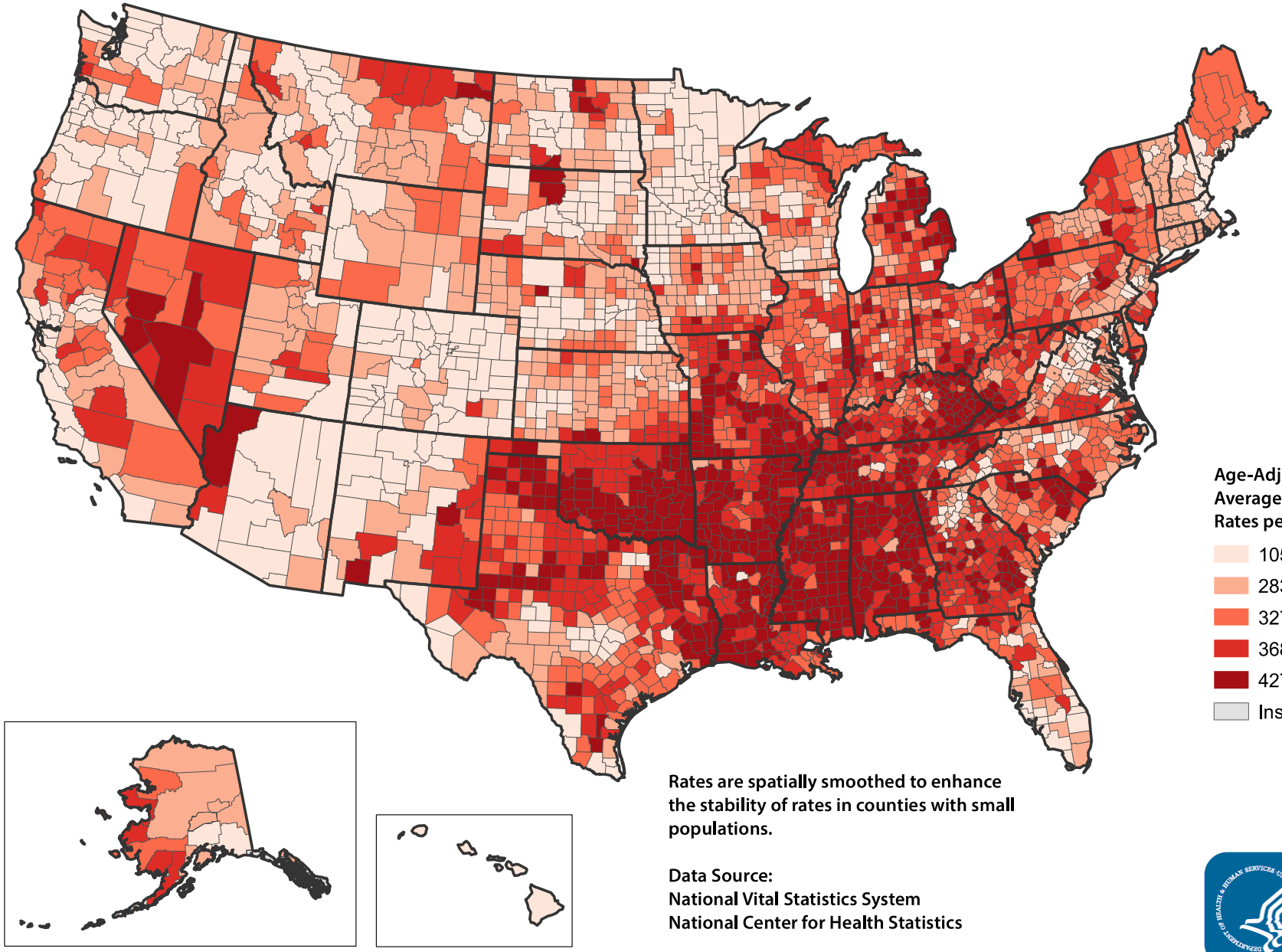
CDC's Division of Diabetes Translation. United States Surveillance System available at http://www.cdc.gov/diabetes/data

Top 10 causes of death in females in the US

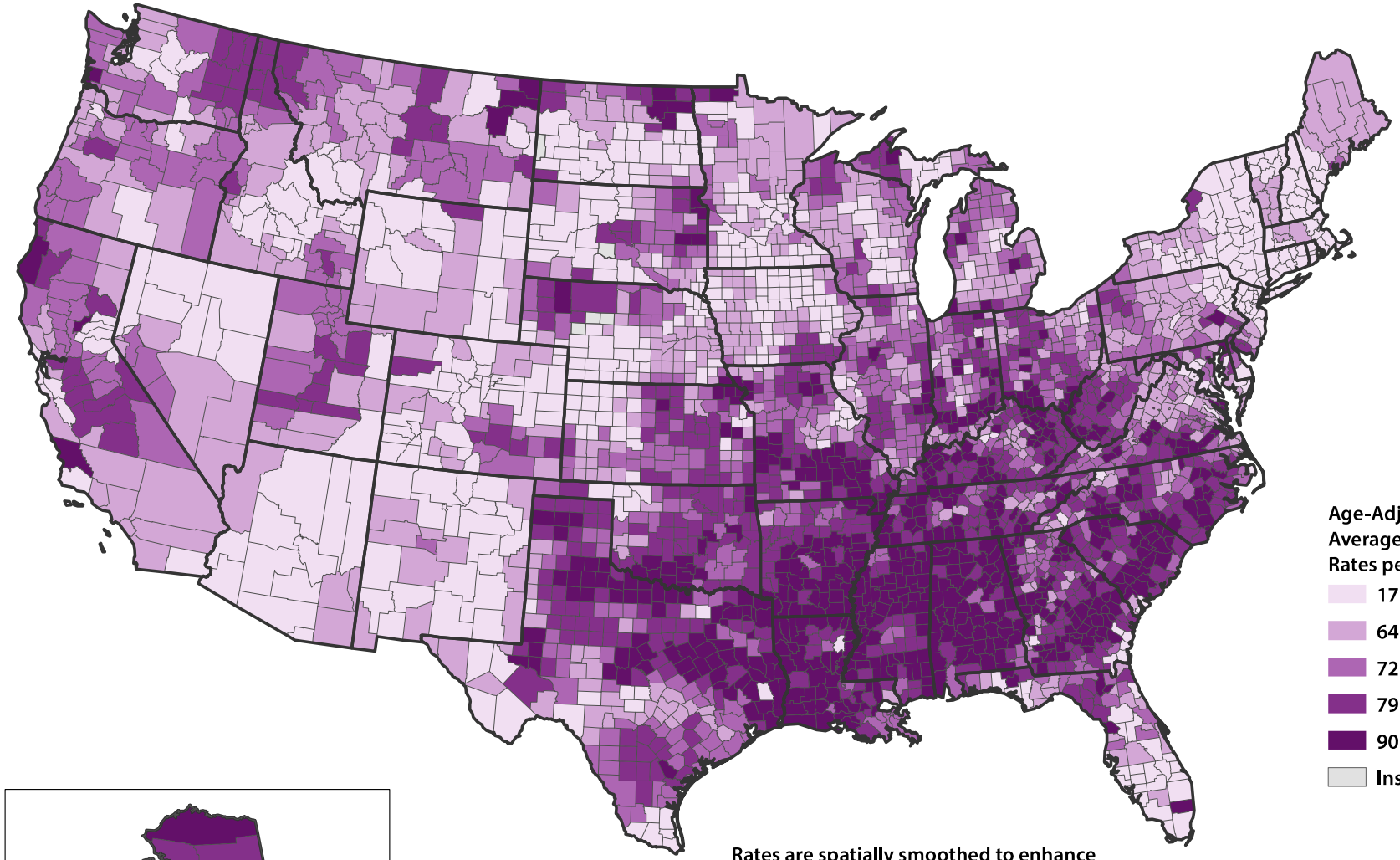
All Females, All Ages	Percent*
1) Heart disease	22.3
2) Cancer	21.1
3) Chronic lower respiratory diseases	6.2
4) Stroke	6.1
5) Alzheimer's disease	5.7
6) Unintentional injuries	4.0
7) Diabetes	2.7
8) Influenza and pneumonia	2.3
9) Kidney disease	1.8
10) Septicemia	1.6

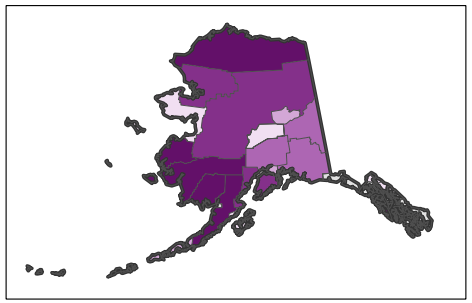
AR Leading Causes of Death, 2014	TDeaths	Death Rate***	State Rank*	U.S. Rate**
1. Heart Disease	7581	217.5	4th	167.0
2. Cancer	6546	183.1	6th	161.2
3. Stroke	1583	58.9	2nd	40.5
4. Chronic Lower Respiratory Diseases	1458	45.4	4th	36.5
5. Accidents	1193	47.4	18th	40.5
6. Alzheimer's Disease	828	34.8	9th	25.4
7. Diabetes	710	24.0	11th	20.9
8. Influenza/Pneumonia	672	20.7	6th	15.1
9. Kidney Disease	550	19.2	6th	13.2
10. Septicemia	515	15.8	7th	10.7

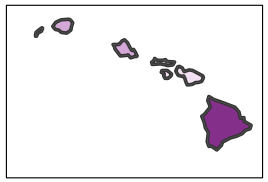
Heart Disease Death Rates, 2013-2015
All Ages 35+, by County



Stroke Death Rates, 2013 - 2015
Adults, Ages 35+, by County







Age-Adjusted
Average Annual
Rates per 100,000

- 17.5 - 64.1
- 64.2 - 72.4
- 72.5 - 79.8
- 79.9 - 90.0
- 90.1 - 207.0
- Insufficient Data

Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

Data Source:
National Vital Statistics System
National Center for Health Statistics

By 2023…

- Arkansas will spend $7 billion dollars treating patients with chronic disease
- $34 billion will be lost due to decreased productivity related to chronic disease
- At present, Arkansas' work force ranked 48th in the US in health indexes

So how does all this relate to breastfeeding?

Mammogenesis and Lactogenesis

- Final stages of mammogenesis occurs in pregnancy
- Lactogenesis occurs as a mother transitions from a pregnant state to a postpartum/lactating state
- Maternal hormones play a critical role in lactogenesis
- Disruption of *physiologically intended function* leads to adverse outcomes

Pregnancy

- Maternal metabolic system changes
  - Increased accumulation of visceral fat
  - Increased insulin resistance
  - Elevated circulating lipid levels

“Reset” hypothesis

- Breastfeeding mobilizes these accumulated stores
- Longer breastfeeding duration more completely depletes these stores
- Prolonged breastfeeding is associated with
  - Improved B-cell function
  - Favorable cardiovascular risk factors
  - Lower risk of hypertension
  - Lower risk of Type 2 Diabetes

Mother: Anemia

- Early postpartum and continued breastfeeding helps the uterus return to pre-partum size

- Reduces blood loss and risk of post-partum hemorrhage

Mother: Cardiovascular disease

- Synthesis of breast milk, particularly lipid globules, removes triglycerides and cholesterol from maternal serum
- Stimulates increased high-density lipoprotein synthesis
- Metabolizes very low density lipoprotein complexes
- Lower serums lipid levels

Mother: Cardiovascular disease

- Suggestion of dose-dependent decrease in hypertension for breastfeeding > 12months
- >3 months breastfeeding protective against aortic calcification (never breastfed OR 5.26 compared)
- >23 months breastfeeding - lower odds of MI (HR 0.63)
- Parous women who have never breastfed – at <65yrs have increased risk of cardiovascular mortality (HR 2.86)

Mother: Cardiovascular disease

- When compared to parous women who have never breastfed
  - 12% lower risk of major cardiovascular disease
- Regarding CVD duration of breastfeeding matters:
  - 0-6 months 1% lower risk
  - 6-12months 7% lower risk
  - 12-18months 11% lower risk
  - 18-24months 13% lower risk
  - >24 months 18% lower risk
    - Each additional 6 months - 4% risk reduction

Mother: Hypertension

- Conflicting results
  - >12 months breastfeeding associated with short term lower blood pressures, OR 0.88
  - Some studies demonstrate the effect mitigated by 10 years post last delivery
  - Blood pressures slightly lower when adjusted for confounders at >65, but are not statistically significant

Mother: Cerebrovascular disease

- When compared to parous women who have never breastfed
  - 9% lower risk of stroke
  - 12% lower risk of ischemic stroke

- Regarding stroke, *duration of breastfeeding matters* with each additional 6 months adding a 3% risk reduction

Mother: Metabolic impact

- 50% of women with gestational diabetes will be diagnosed with Type 2 Diabetes within 5-8 years
- Decreased risk of Type 2 diabetes by 14-15% when compared to parous women who have never breastfed
- Risk reduction appears to be dose dependent (though non-linear)
- Lactation was an independent predictor of increased insulin sensitivity, higher glucose tolerance, and decreased insulin levels
  - In some studies decreasing risk of T2DM by 30-40%

Mother: Reproductive cancer

- Large meta-analysis showed 30% reduction in ovarian cancer associated with longer breastfeeding duration (<18 months)

- For every 12 months breastfeeding there is a cumulative 4.3% decrease in risk of breast cancer

Long term effect on the breastfed infant

Breastfeeding and Infant health

- Decreased risk of death in the first year of life by 21%
  - Risk of SIDS (by 50%)
  - Risk of chronic illness: asthma, allergies, colitis
  - Risk of leukemia and lymphoma
  - Risk of hospitalization due to GI and respiratory illness
  - Risk of emergency/ill doctors visits: otitis, respiratory, asthma, GI infection/ailments

Infant: cardiovascular effects

- Formula fed infants higher levels of inflammatory markers associated with atherosclerotic disease in adults

- Higher childhood cholesterol and LDL profiles associated with non-breastfed and partially breastfed infants compared to exclusively breastfed infants

Infant: Obesity and Diabetes

- Decreased risk of obesity, OR 0.76
  - Compared “ever breastfed” to never breastfed

- Decreased odds of Type 2 Diabetes, OR 0.65
  - Compared “ever breastfed” to never breastfed
  - Better risk reduction associated with exclusive breastfeeding and longer duration of breastfeeding

Infant: Inflammatory Bowel Disease

- Crohn's disease OR 0.45
  - Associated with any breastfeeding

- Ulcerative colitis, OR 0.56
  - Associated with any breastfeeding

Infant: Asthma and Allergy

- Genetic predisposition plays a heavy role
- Breastfeeding mediates severity of disease
  - Reduced wheezing up to 15% with exclusive breastfeeding
- Fewer respiratory hospitalizations in breastfed infants, RR 0.68

Infant: Childhood Cancer

- Any breastfeeding reduced risk of acute lymphoblastic leukemia, OR 0.82

- Breastfeeding 6 months (any amount) risk reduction
  - Acute myelogenous leukemia, OR 0.85
  - Acute lymphoblastic leukemia, OR 0.81

Infant: Ongoing study

- Breastfeeding in infancy
  - Reduces risk of multiple sclerosis
  - Reduced risk of juvenile idiopathic arthritis
  - Mediates autoimmune potential
    - Reduced risk of Type 1 diabetes
    - Immune mediated gastrointestinal disease
- Microbiomic dysbiosis determinants of long term health

The cost of suboptimal breastfeeding

Real differences

- Increased breastfeeding rates
  - In US save >900 lives annually
  - Worldwide prevent 823,000 childhood (<5yrs old) deaths annually
  - Worldwide prevent 20,000 deaths from breast cancer

Real cost

- Annual cost
  - 4981 excess cases of breast cancer
  - 53,847 excess cases of hypertension
  - 13,946 excess cases of myocardial infarction

  - Cost $17.4 billion related to premature (<70) death of women
  - $733.7 million in direct healthcare costs for women
  - Save $13 billion dollars in healthcare costs for infants/children

Importance of breastfeeding

- Societal health
  - Fewer missed days of work for breastfeeding mothers
  - Fewer sick visits to doctors and ER
  - Better long term societal health indexes
  - Fewer deaths from preventable causes
  - Decreased healthcare costs

advocacy

- Support Baby Friendly Hospital Initiatives
- Encouraged by American Academy of Pediatrics, American College of Obstetric and Gynecologists, World Health Organization, Centers for Disease Control, National Institute of Health, Institute of Medicine….
- Tool kit produced by ACOG for obstetrician advocacy in the prenatal setting
  - http://www.acog.org/About-ACOG/ACOG-Departments/Toolkits-for-Health-Care-Providers/Breastfeeding-Toolkit

What everyone can do

- Support ALL breastfeeding mothers
  - Employees
    - Time/space to pump – have a policy
    - Minimum 6 weeks maternity leave
  - Patients
    - Breastfeeding friendly office space
    - Encourage pregnant patients to breastfeed
    - DON'T discourage due to medications/medical conditions
      - Consult lactation consultant
      - Infant Risk Center 806-352-2519


Thank You!!!

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