



Role of Breastfeeding and Weaning in Prevention of Future Allergic Disease

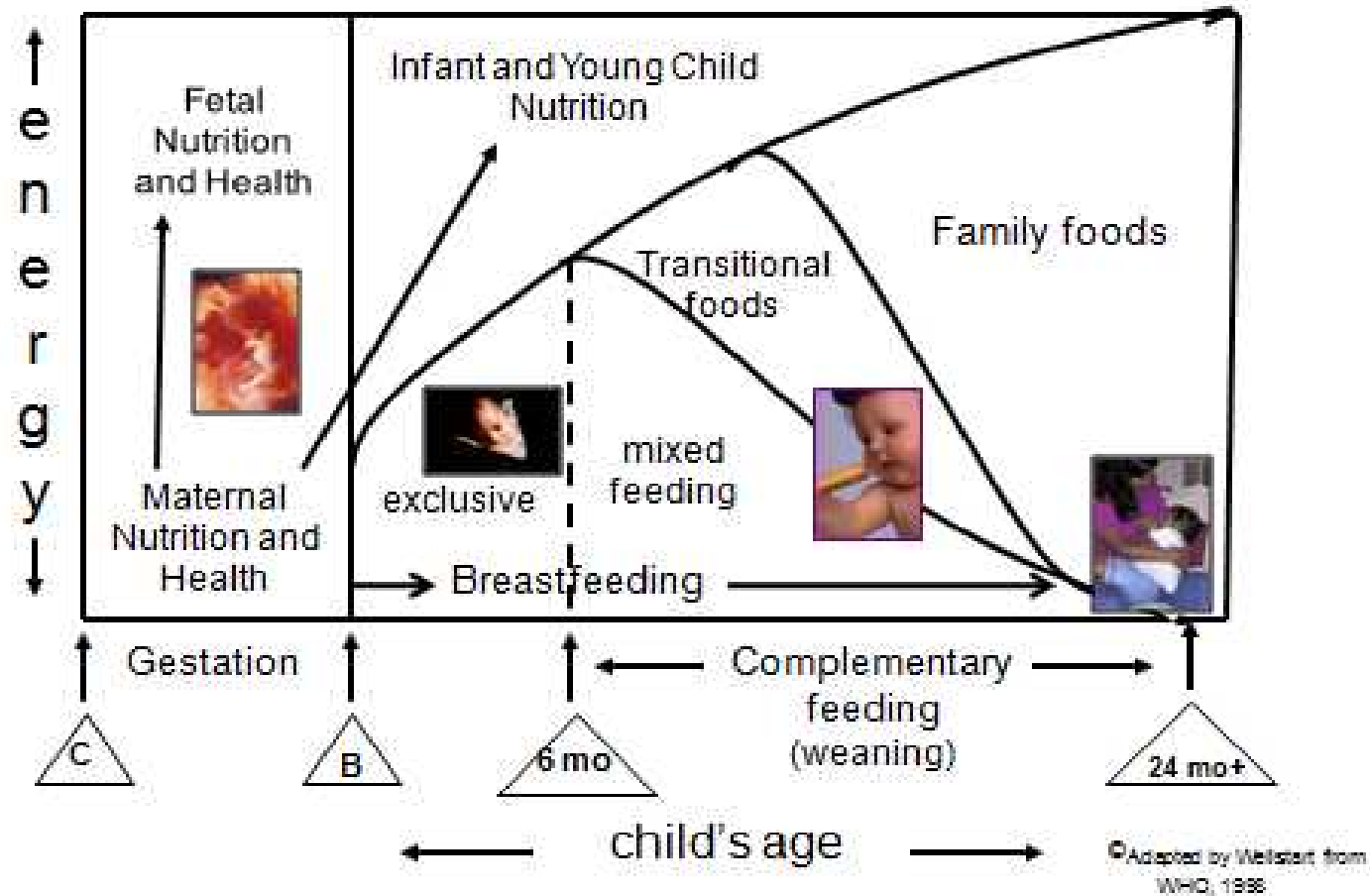
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The Big Question

Does early consumption of breast milk provide long-term benefits by protecting individuals from chronic diseases later in life?

Optimal Infant and Young Child Feeding



Breast Milk and Allergy

- First immunization
- SIgA
- Establishment of protective microbial pop in GIT
- Promote GIT epithelial maturation
- Stimulate the immune system of the baby
- Antigen specific Ab
- Tolerance

Immunological Factors in Human Milk that may be Associated with Allergy: **TGF- β 1**

- Cytokine, transforming growth factor- β 1 (**TGF- β 1**) promotes tolerance to food components in the intestinal immune response
- **TGF- β 1** in mother's colostrum may influence the type and intensity of the infant's response to food allergens
- A normal level of **TGF- β 1** is likely to facilitate tolerance to food encountered by the infant in mother's breast milk and later to formulae and solids

Immunological Factors in Human Milk that may be Associated with Allergy: TGF- β 1 (continued)

- TGF- β 1 in mothers of infants who developed IgE-mediated CMA
 - (+challenge; + SPT) *lower* than in:
 - Mothers of infants with non-IgE CMA
(+ challenge; - SPT)
 - Mothers of infants without CMA
(- challenge; - SPT)

Breastfeeding and Allergies

- Evidence to suggest that breastfeeding may significantly alter the immune system of the suckling infant
- Length of exclusive breastfeeding and time of solid foods introduction is a key factor that may influence allergy development
- Clues to this early influence are seen in the effects of breastfeeding on:
 - Thymus size
 - Antibody response to vaccination
 - Increased tolerance to BM antigens

SM Parigi et al, 2015, Breast milk and solid food shaping intestinal immunity; Pa T Ngom et al, 2004, Improved thymic function in exclusively breastfed infants is associated with higher interleukin 7 concentrations in their mothers' breast milk; Eric W. Rogier et al, 2014, Secretory antibodies in breast milk promote long-term intestinal homeostasis by regulating the gut microbiota and host gene expression

The Breastfed Baby

Immune system.

Responds better to vaccinations. Human milk helps to mature immune system. Decreased risk of childhood cancer.

Skin.

Less allergic eczema in breastfed infants.

Joints and muscles.

Juvenile rheumatoid arthritis is less common in children who were breastfed.

Throat.

Children who are breastfed are less likely to require tonsillectomies.

Eyes.

Visual acuity is higher in babies fed human milk.

Ears.

Breastfed babies get fewer ear infections.

Higher IQ.

Cholesterol and other types of fat in human milk support the growth of nerve tissue.

Endocrine system.

Reduced risk of getting diabetes.

Mouth.

Less need for orthodontics in children breastfed more than a year. Improved muscle development of face from suckling at the breast. Subtle changes in the taste of human milk prepare babies to accept a variety of solid foods.

Bowels.

Less constipation.

Urinary tract.

Fewer infections in breastfed infants.

Appendix.

Children with acute appendicitis are less likely to have been breastfed.

Kidneys.

With less salt and less protein, human milk is easier on a baby's kidneys.

Respiratory system.

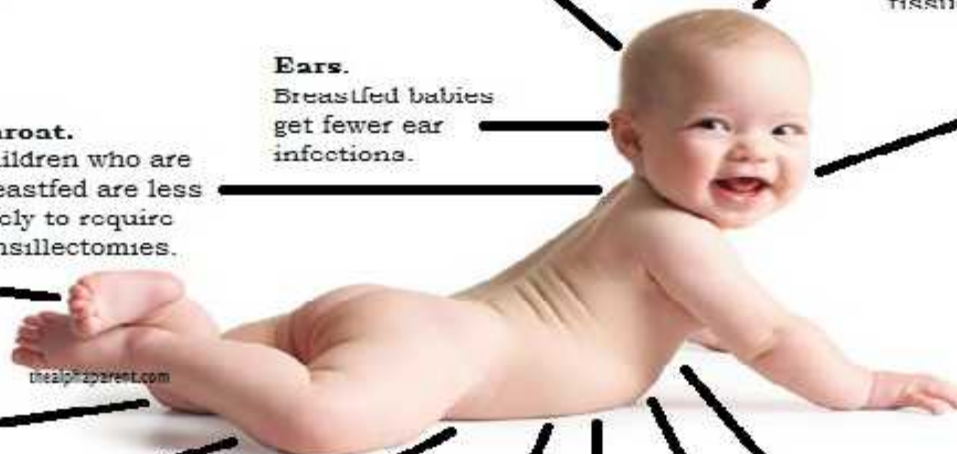
Breastfed babies have fewer and less severe upper respiratory infections, less wheezing, less pneumonia and less influenza.

Digestive system.

Less diarrhea, fewer gastrointestinal infections in babies who are breastfeeding. Six months or more of exclusive breastfeeding reduces risk of food allergies. Also, less risk of Crohn's disease and ulcerative colitis in adulthood.

Heart and circulatory system.

Breastfed children have lower cholesterol as adults. Heart rates are lower in breastfed infants.



thealphaparent.com

Breastfeeding reduces risk of five types of allergic disease

Birth cohort of 4,089 infants in Sweden

- Information about various exposures was obtained by parental questionnaires when the infants were 2 months old, and about allergic symptoms and feeding at 1 and 2 years of age
- Duration of exclusive and partial breastfeeding was assessed separately
- Children exclusively breastfed for four months or more exhibited less asthma, less atopic dermatitis and less suspected allergic rhinitis by 2 years of age.
- There was a significant risk reduction for asthma related to partial breast feeding for six months or more
- Five possible allergic disorders — asthma, suspected allergic rhinitis, atopic dermatitis, food allergy related symptoms, and suspected allergic respiratory symptoms after exposure to pets or pollen — were studied
- Exclusive breastfeeding prevented children from having multiple allergic disease during the first two years of life
- The authors concluded that exclusive breastfeeding seems to have a preventive effect on the early development of allergic disease, including multiple allergic disease, up to 2 years of age.

Kull I et al, 2002. Breastfeeding and allergic diseases in infants – a prospective birth cohort study. Arch Dis Child 87: 478-481

Breastfeeding decreases the risk of allergic disorders – a prospective birth cohort study

Type of feeding	Asthma	Atopic dermatitis	Allergic rhinitis
Children exclusively breastfed 4 months or more	7.7%	24%	6.5%
Children breastfed for a shorter period	12%	27%	9%

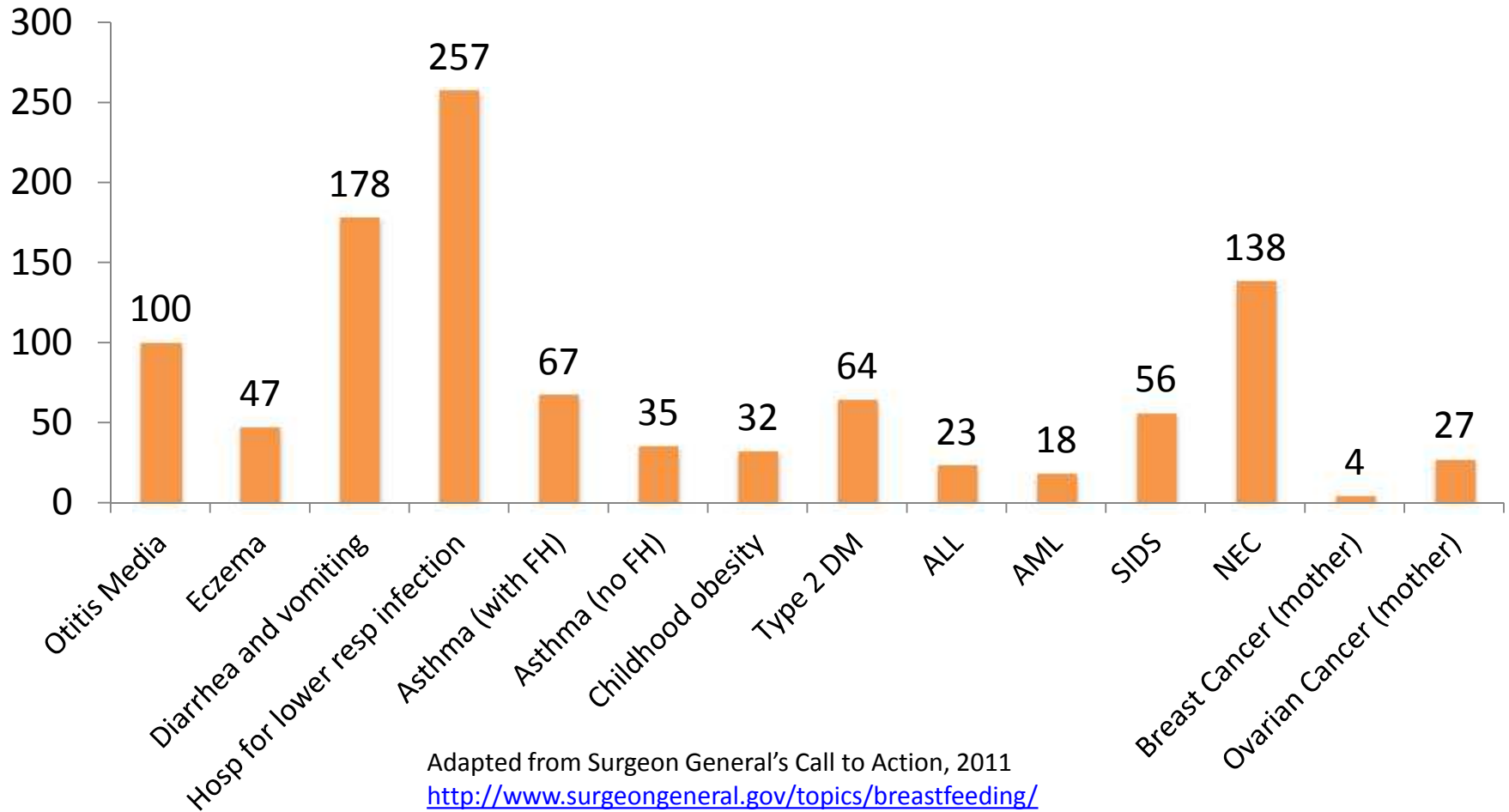
Adapted from Kull I. et al. Breastfeeding and allergic diseases in infants - a prospective birth cohort study. *Archives of Disease in Childhood* 2002; 87:478-481.

Breast-feeding and Allergy

- Other studies are in conflict with these conclusions:
 - Some report no improvement in symptoms
 - Some suggest symptoms get worse with breast-feeding and improve with feeding of hydrolysate formulae
 - Japanese study suggests that breast-feeding increases the risk of asthma at adolescence
- Why the conflicting results?

Risks of Not Breastfeeding

Excess Risk Associated with Not Breastfeeding (%)



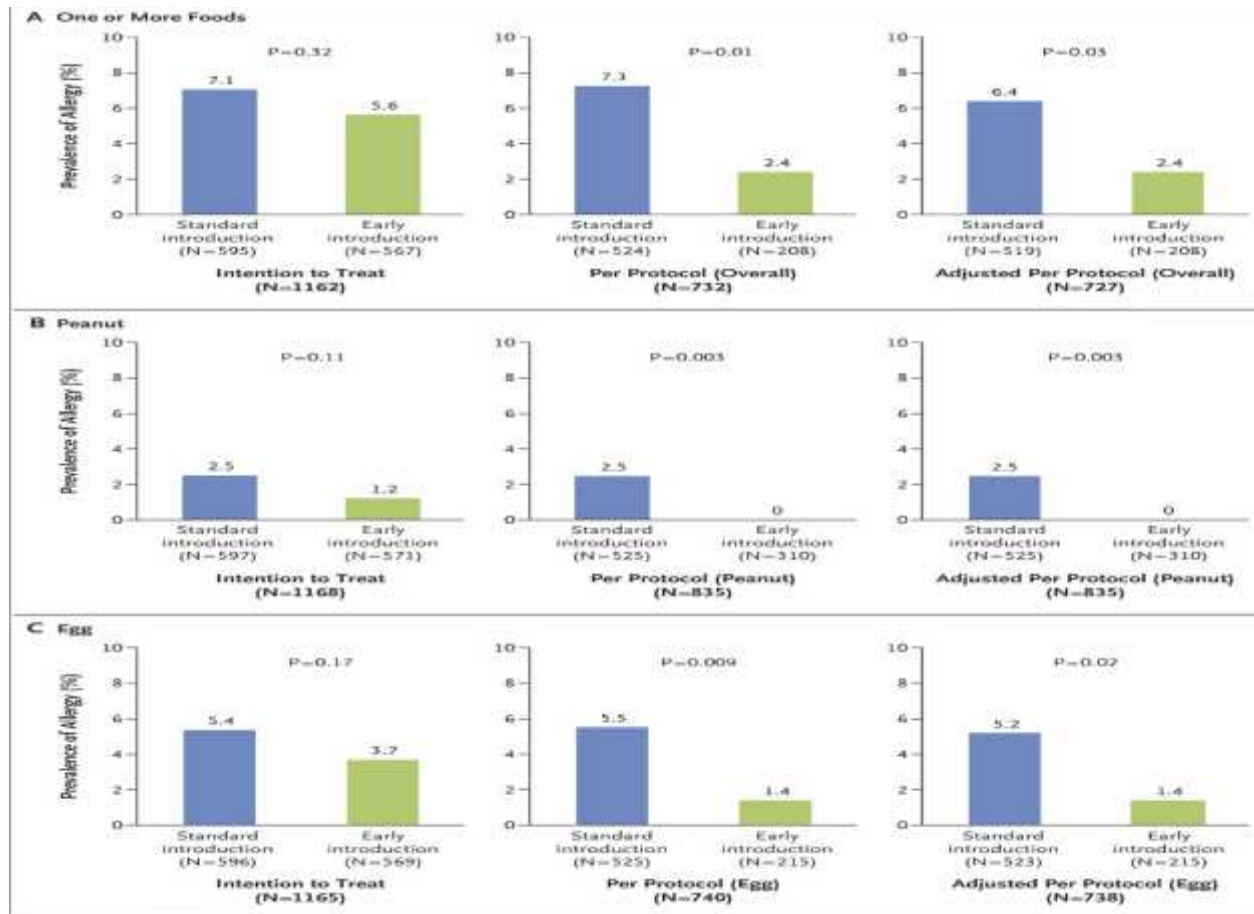
Weaning and allergic diseases

Fundamental changes in the infant's immune system as a result of premature cessation of breastfeeding

Groundwork for later dysfunction in the immunologic controls necessary to prevent autoimmune disease or hypersensitivity reactions

There is no evidence that delaying the introduction of any specific food beyond 6 months of age helps to prevent allergy

Randomized Trial of Introduction of Allergenic Foods in Breast-Fed Infants



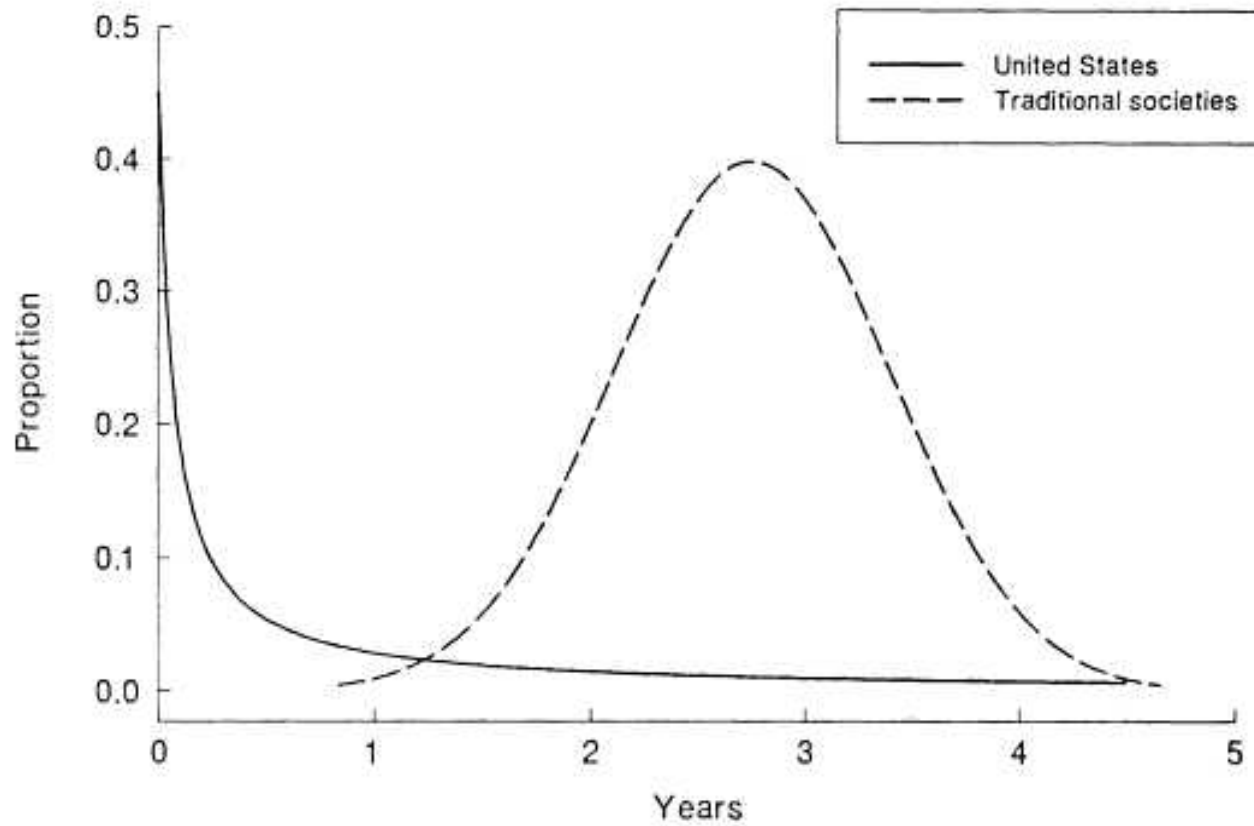
When to Wean

- [World Health Organization recommendations](#)
“continue frequent, on-demand breastfeeding until two years of age or beyond”
- [American Academy of Pediatrics](#) “for as long as is mutually desired by the mother and baby”
- [United Nations Children’s Fund](#)
- United States [Center for Disease Control](#)
The list of evidence-based public health recommendations goes on & on

What Primates Teach Us About Weaning Age

- A young primate's weaning age in days is equal to 2.71 times their mother's body weight in grams to the 0.56 power
- This calculation predicts (given the range of female body sizes around the world from the South Africa to the Arctic) that *humans should have an average weaning age of between 2.8 and 3.7 years old !*

Age at Weaning

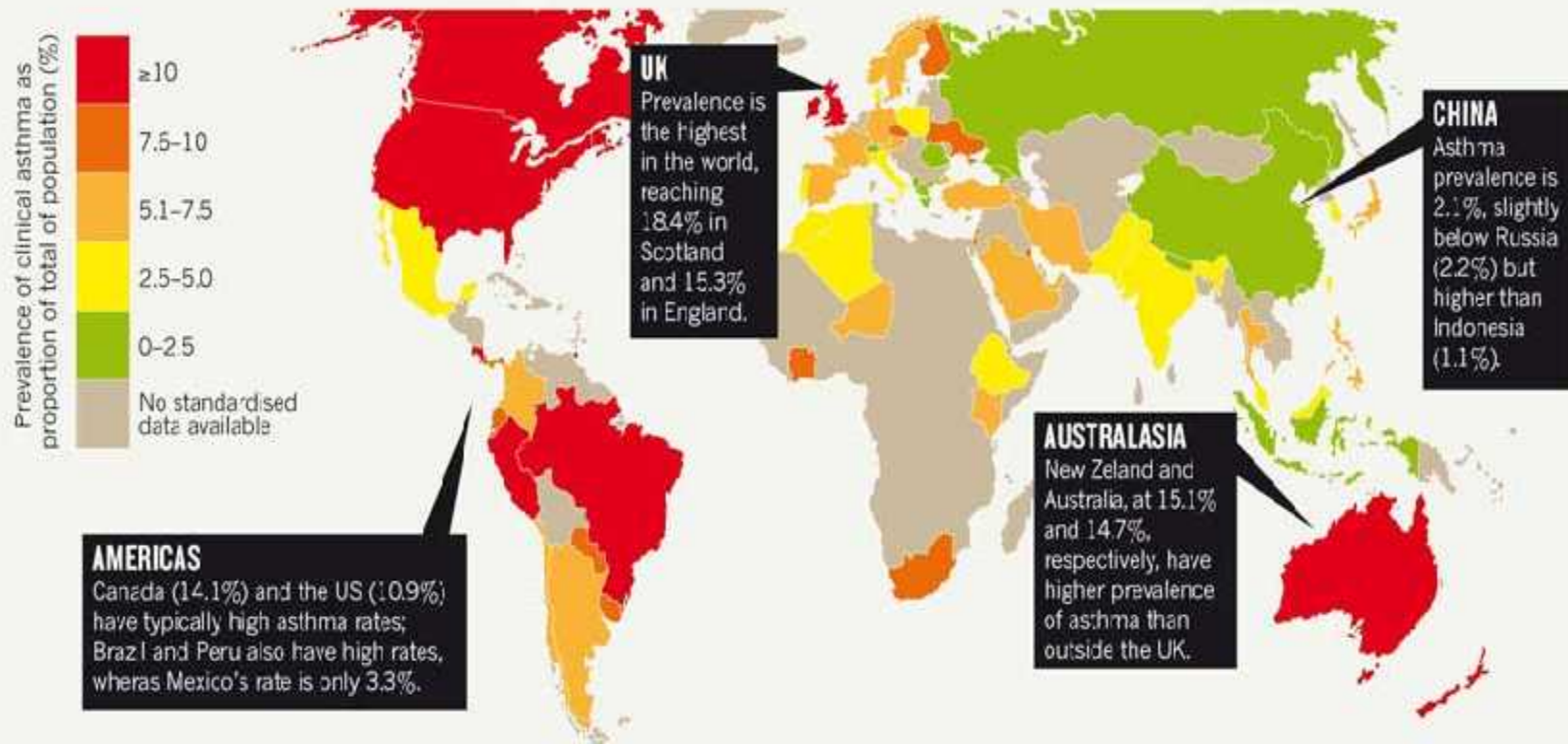


A comparison of age at weaning in the United States and in 64 traditional societies
Reproduced from Stuart-Macadam & Dettwyler (1995)



ASTHMA AROUND THE WORLD

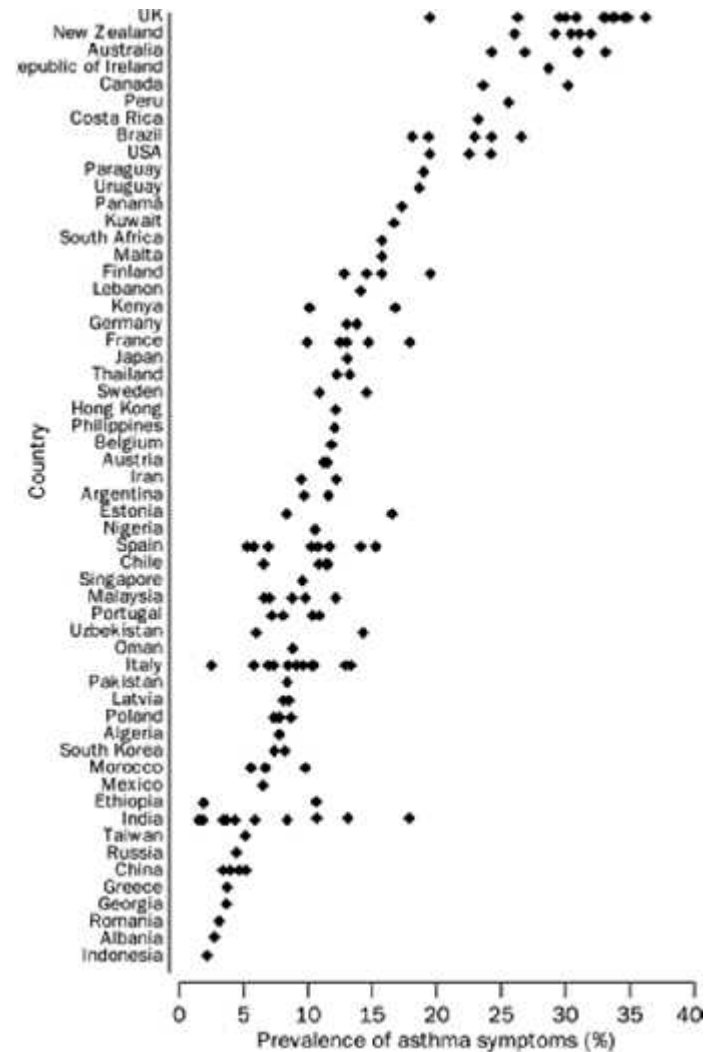
Global studies confirm an association with westernized lifestyles



World Variation in prevalence of Asthma, rhinitis and Eczema – ISAAC group Lancet 1998

UK, Australia

Indonesia, Ethiopia

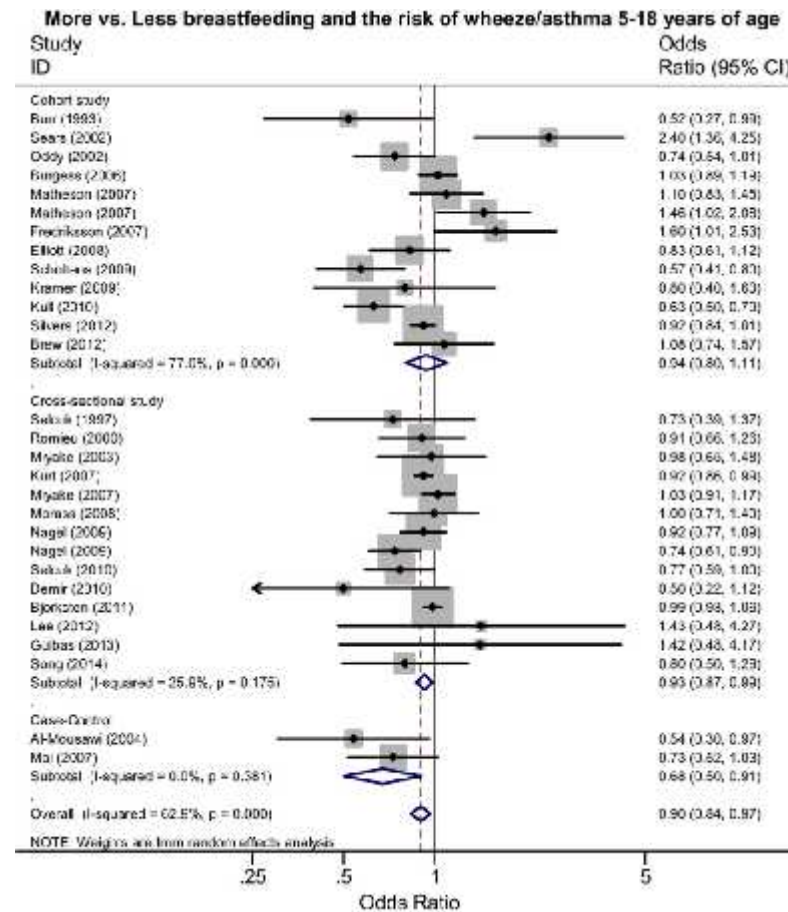


However.....

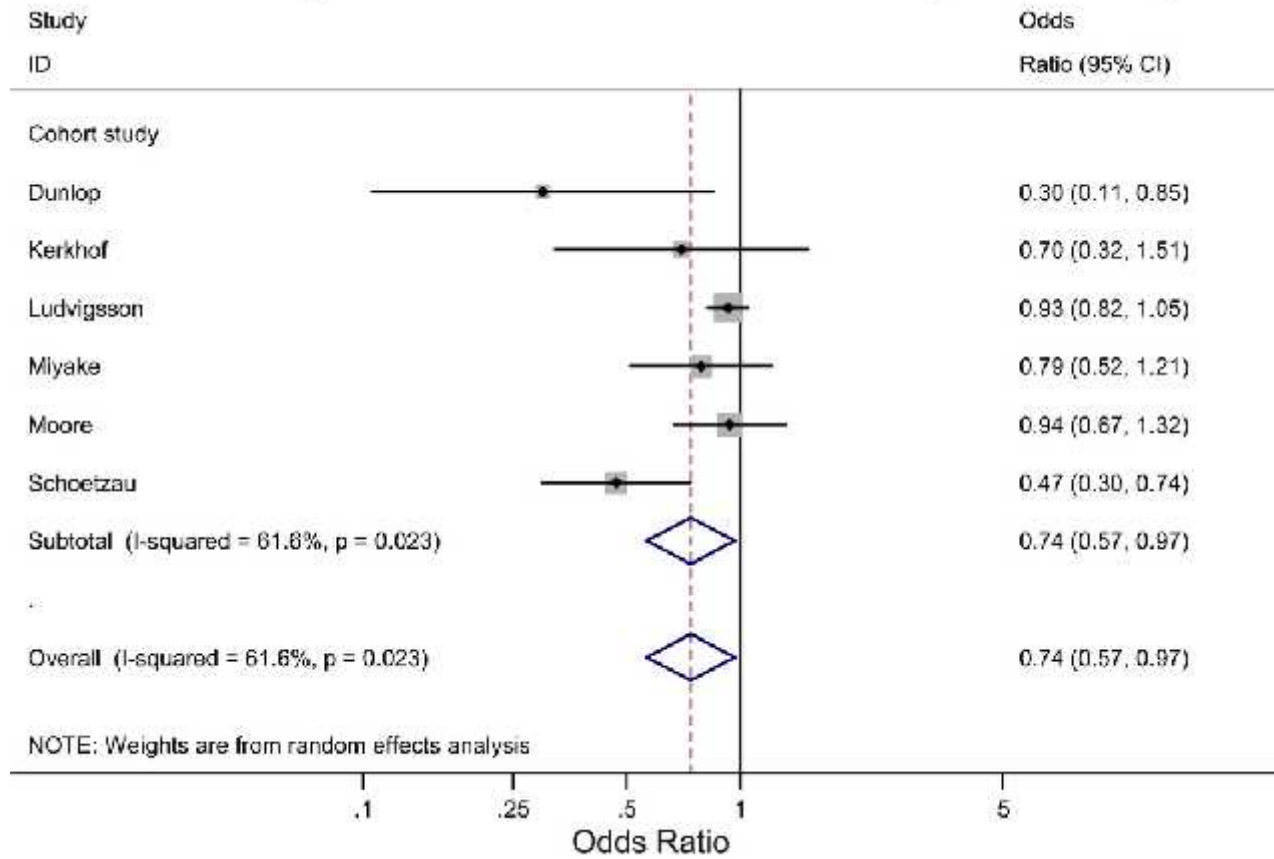
The role of human milk in the development of allergic sensitization remains controversial

- Especially in view of the difficulty to perform randomized clinical trials
- Methodological differences in the existing data

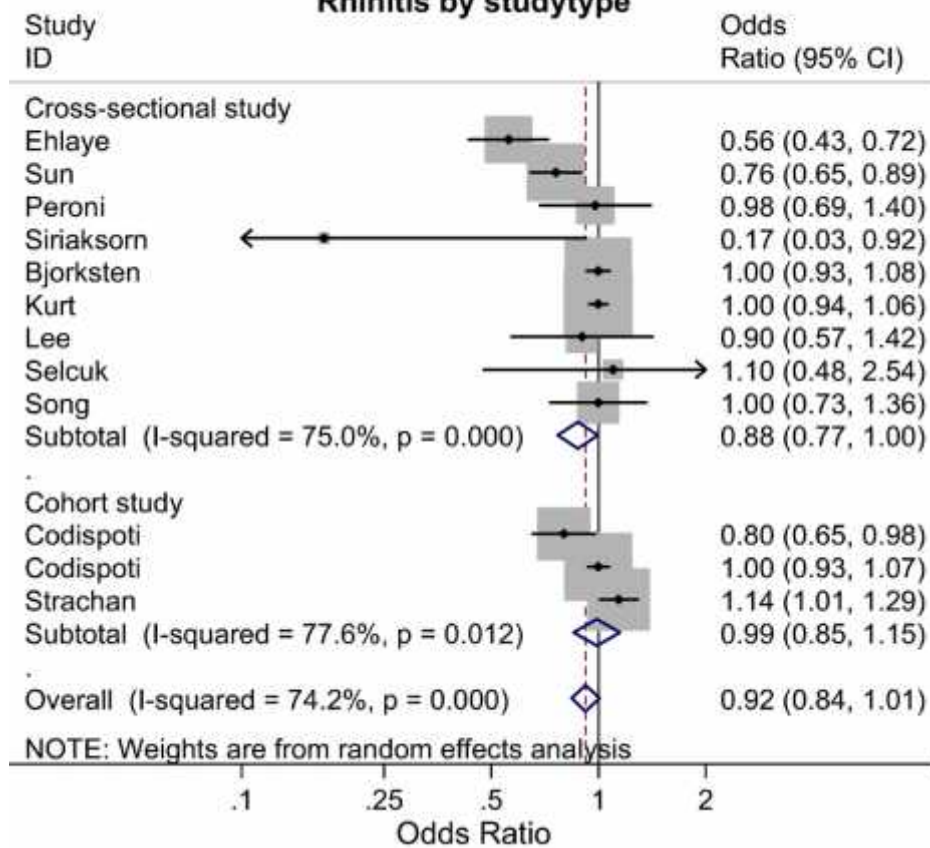
Breastfeeding and asthma and allergies: a systematic review and meta-analysis



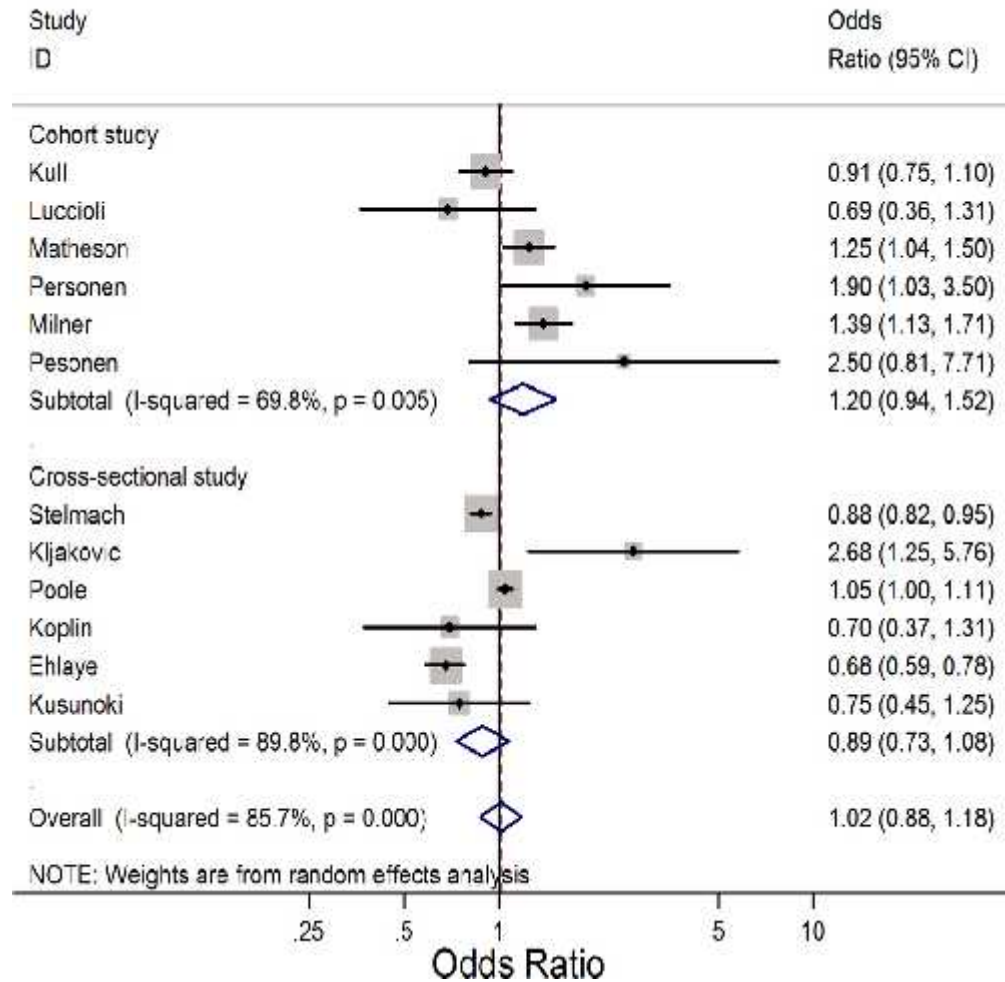
Breast feeding after 3-4 months and the risk of eczema up to 2 years of age



More vs. Less Breast feeding and the risk of Allergic Rhinitis by studytype



More vs. Less Breast feeding and the risk of Food Allergy



Conclusion

- BF provides immune tolerance and prevent various diseases in the peri-natal period and later life
- Why is there still confusion about the impact of breast-feeding on the risk of allergy development?



Thank
you