



ASSET

share and move to face nasty bugs

THE WOMAN ROLE ACCORDING TO A LIFECOURSE HEALTH PROMOTION PERSPECTIVE

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GENDER IMPLICATION

The ASSET FINAL EVENT

*Share and move for mobilization and mutual learning at local,
national and international levels on Science in Society related issues
in epidemics and pandemics
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Disclosures

Health Industry Interests Relevant to Presentation

Angela Giusti

- | | |
|--|-----------|
| 1 – Patent holder/Shareholder or member or employee of a health industry | NO |
| 2 – Consultant or member of a scientific council of a health industry | NO |
| 3 – Paid speaker or author/editor of articles or documents for a health industry | NO |
| 4 – Payment of travel expenses, lodging, or conference/event registration by a health industry | NO |
| 5 – Principal Investigator or co-investigator of a research or clinical study for a health industry | NO |





“If a new vaccine became available that could prevent 1 million or more child deaths a year, and that was moreover cheap, safe, administered orally, and required no cold chain, it would become an immediate public health imperative.

Breastfeeding could do all this and more, but it requires its own "*warm chain*" of support that is, skilled care for mothers to build their confidence and show them what to do, and protection from harmful practices.”

Dobbing J et al. **Warm chain for breastfeeding**. The Lancet, 1994





Where does health come from?

The concept of Primal Health

- The **Primal Period**, the period of human development when **the basic adaptive systems related to our health** reach their maturity (pregnancy → 2yrs)
- Basing on the recent research on neurobiology, human microbiome and epigenetics we are starting to understand how determinant the Primal Period is for human health – as individuals and population



The human microbiome

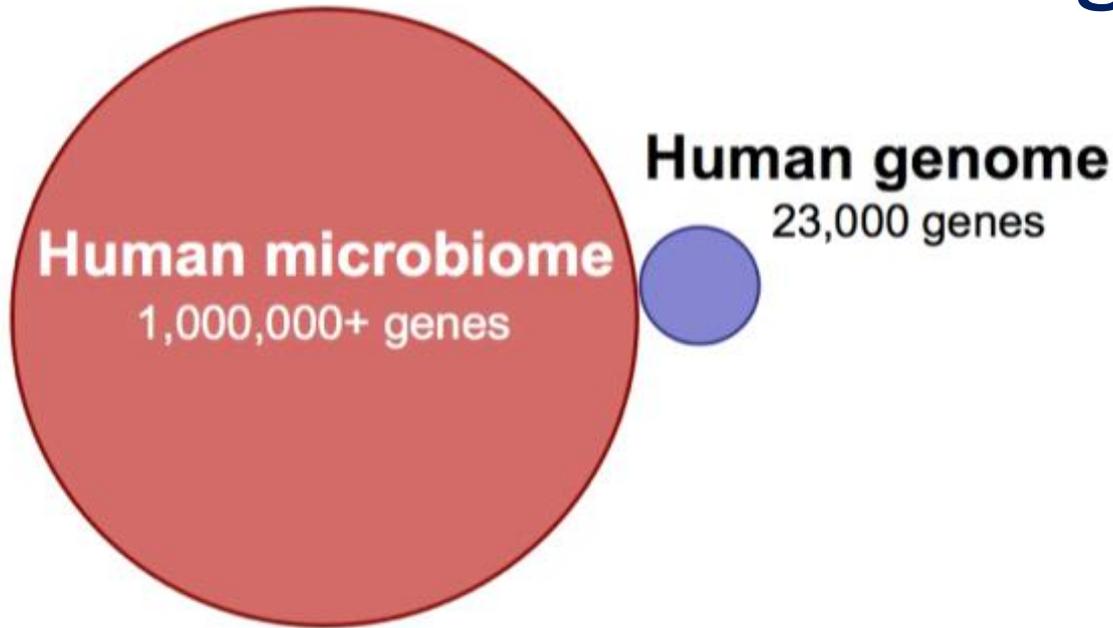
Video

[Link](#)

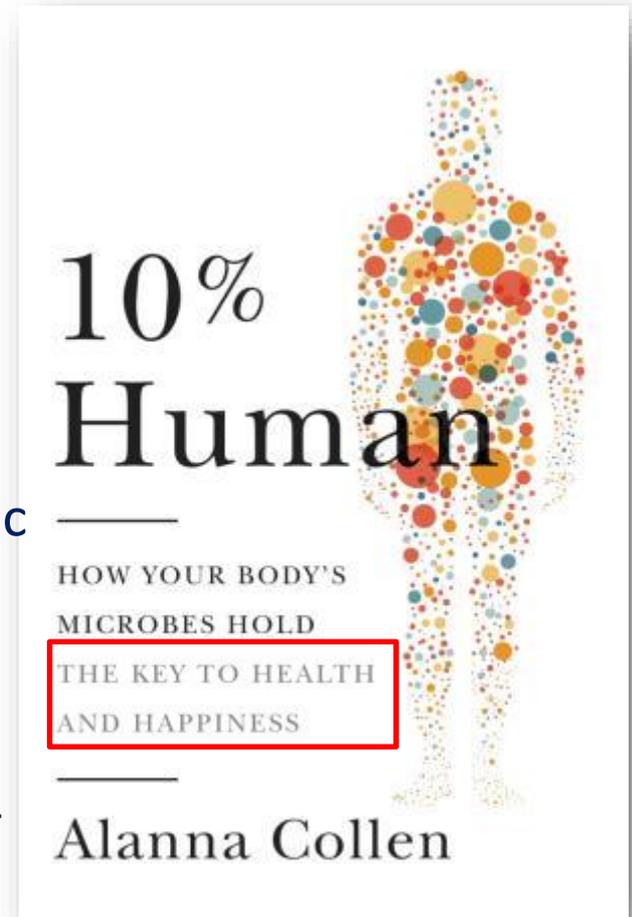




The human metagenome



- The MB is species-specific and individual-specific
- Our systems do not work basing on our genetic code (23,000 genes); our biology is based on this code + the genetic code of all our bacteria (1,000,000 genes), through an incredible and little-known interaction



THE HUMAN

MICROBIOME

Bacteria, fungi, and viruses outnumber human cells in the body by a factor of 10 to one. The microbes synthesize key nutrients, fend off pathogens and impact everything from weight gain to perhaps even brain development. The Human Microbiome Project is doing a census of the microbes and sequencing the genomes of many. The total body count is not in but it's believed over 1,000 different species live in and on the body.

25 SPECIES

in the **stomach** include:

- *Helicobacter pylori*
- *Streptococcus thermophilus*

500-1,000 SPECIES

in the **intestines** include:

- *Lactobacillus casei*
- *Lactobacillus reuteri*
- *Lactobacillus gasseri*
- *Escherichia coli*
- *Bacteroides fragilis*
- *Bacteroides thetaiotaomicron*
- *Lactobacillus rhamnosus*
- *Clostridium difficile*

600+ SPECIES

in the **mouth, pharynx and respiratory system** include:

- *Streptococcus viridans*
- *Neisseria sicca*
- *Candida albicans*
- *Streptococcus salivarius*

1,000 SPECIES

in the **skin** include:

- *Pityrosporum ovale*
- *Staphylococcus epidermidis*
- *Corynebacterium jeikeium*
- *Trichosporon*
- *Staphylococcus haemolyticus*

60 SPECIES

in the **urogenital tract** include:

- *Ureaplasma parvum*
- *Corynebacterium aurimucosum*



Diseases influenced by gut microbial metabolism.

The variety of systemic diseases that are directly influenced by gut microbial metabolism and its influence on other mammalian pathways, such as the innate immune system, are shown.

Specifically highlighted are the metabolic pathways involved in drug metabolism and obesity that are directly influenced by the gut microbial content.

Gut-brain hypothesis
 1. Autism
 ↑ *C. botteae* / clostridia spores
 Mechanism unknown
 2. Mood: depression, anxiety

Asthma / atopy
 Hygiene hypothesis:
 Exaggerated innate immune response
 Upregulation of regulatory T cells after capture of Ags by DCs
 ↓ Bifidobacteria, Gram +ve organisms
 ↑ Clostridia

Hypertension / ischemic heart disease

Colon cancer
 Diet high in red meat and animal fat
 Low SCFA / butyrate
 High fecal fats
 Low vitamin absorption
 ↑ 7α dehydroxylating bacteria:
 cholic acid → deoxycholic acid (co-carcinogen)
 Low in H₂S metabolizing bacteria

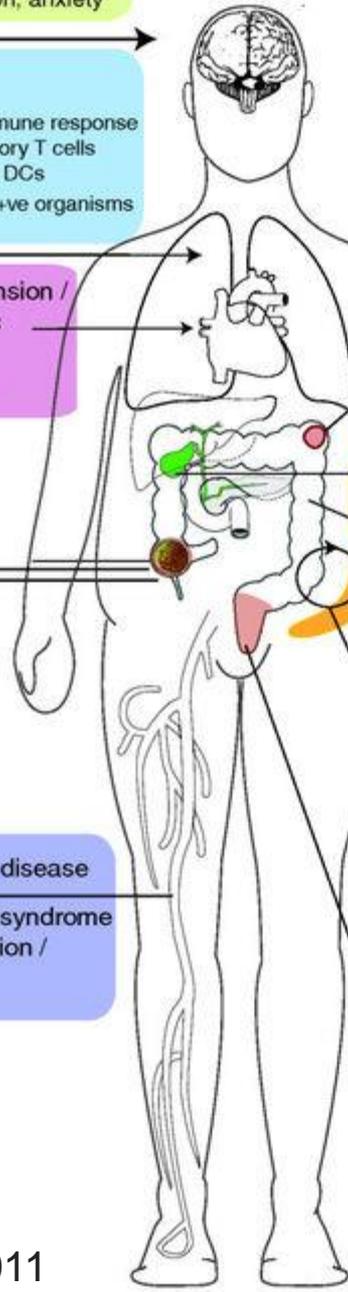
Biliary disease Altered enterohepatic circulation of bile

Altered xenobiotic / drug metabolism
 e.g. **Paracetamol** metabolism:
 ↑ predose urinary *p*-cresol sulfate leads to ↓ postdose urinary acetaminophen sulfate : acetaminophen glucuronide.
 Bacterially mediated *p*-cresol generation and competitive *o*-sulfonation of *p*-cresol reduces the effective systemic capacity to sulfonate acetaminophen.

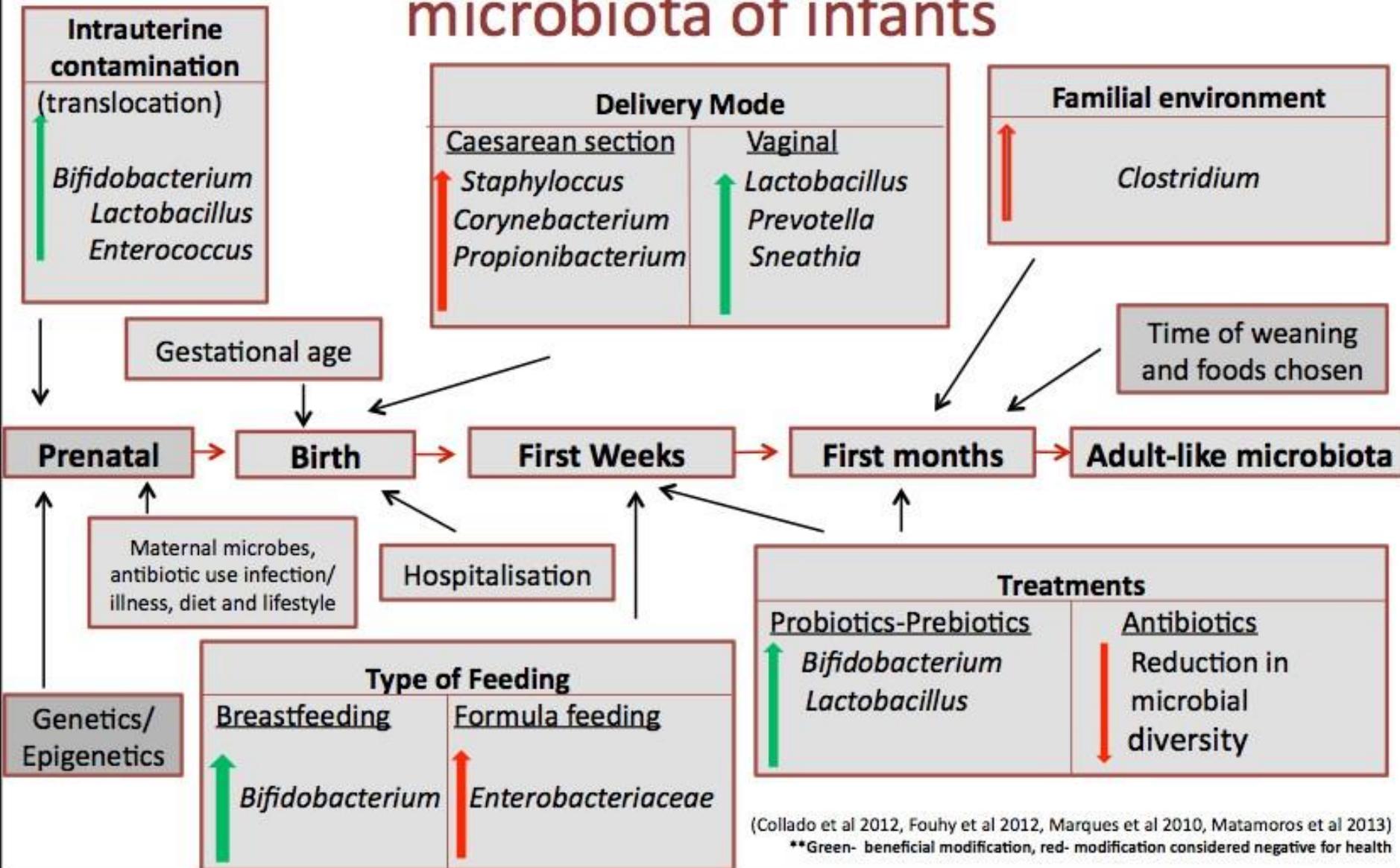
Obesity / metabolic syndrome
 ↓ *Bacteroidetes* and ↑ *Actinobacteria* in obese
 Altered energy / lipid metabolism
 Higher relative abundance of glycoside hydrolases, carbohydrate-binding modules, glycosyltransferases, polysaccharide lyases, and carbohydrate esterases in the *Bacteroidetes*
 TLR mediated

Peripheral vascular disease
 Result of metabolic syndrome
 Altered lipid deposition / metabolism

Inflammatory bowel disease
 Hygiene hypothesis
 Altered immune response: TLR signaling
 Less microbial diversity
 Activation of specific species: for example, *Escherichia*

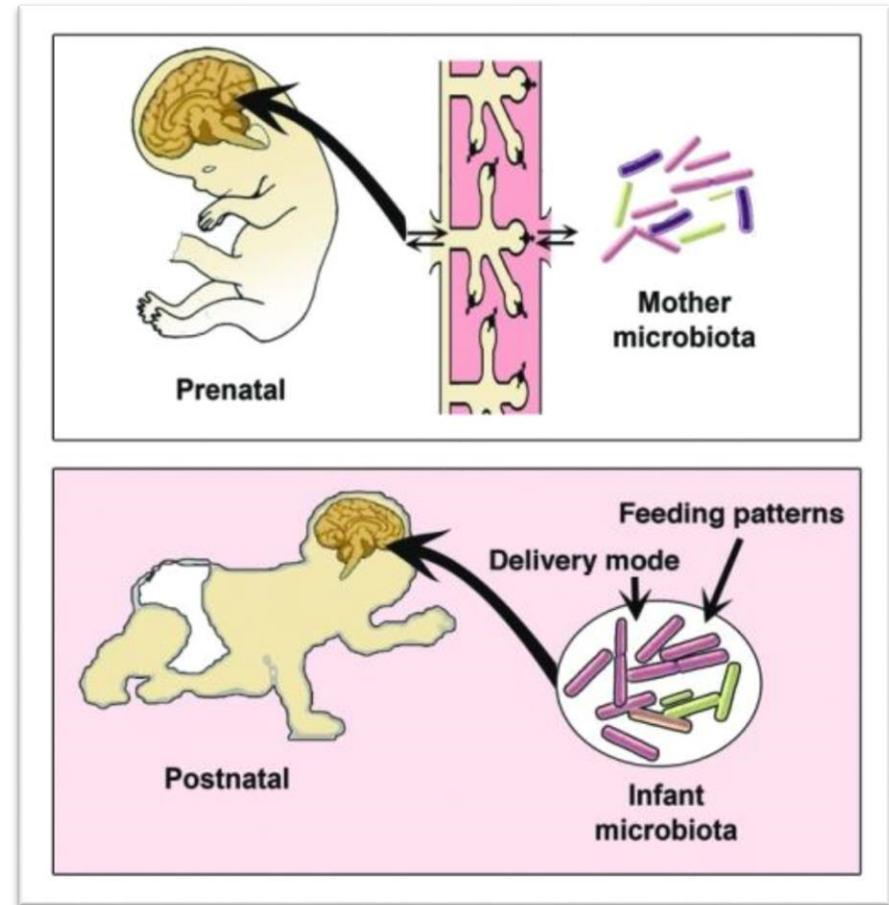
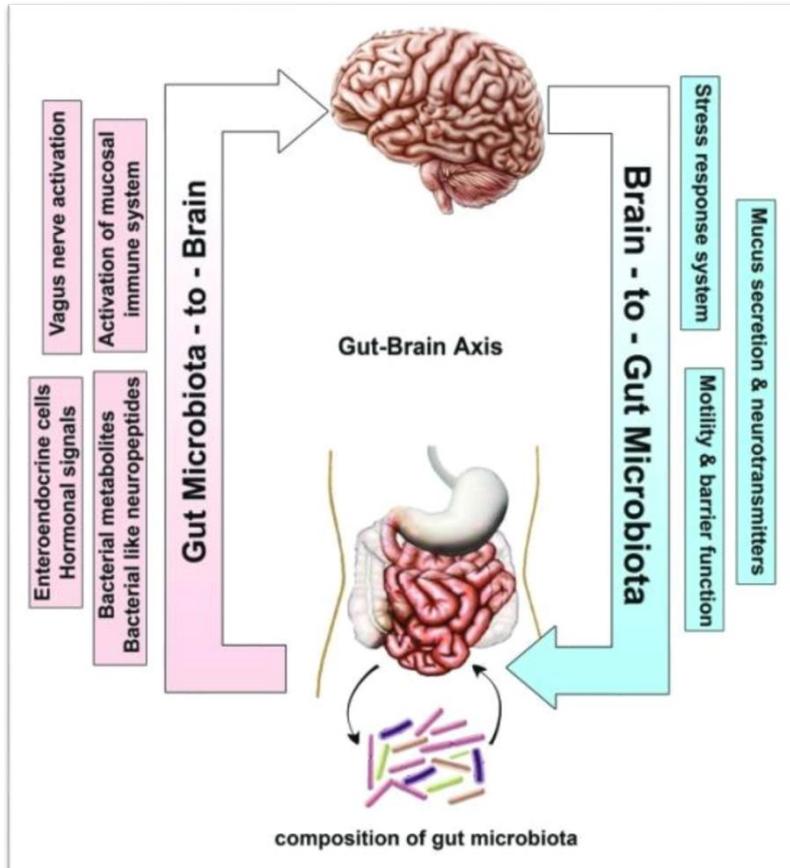


Influence of external factors on intestinal microbiota of infants





Gut microbiota-to-Brain communications during prenatal and postnatal development.



Al-Asmakh, 2012. Tognini, 2017





Colostrum and mother's milk: a source of probiotic bacteria for the baby

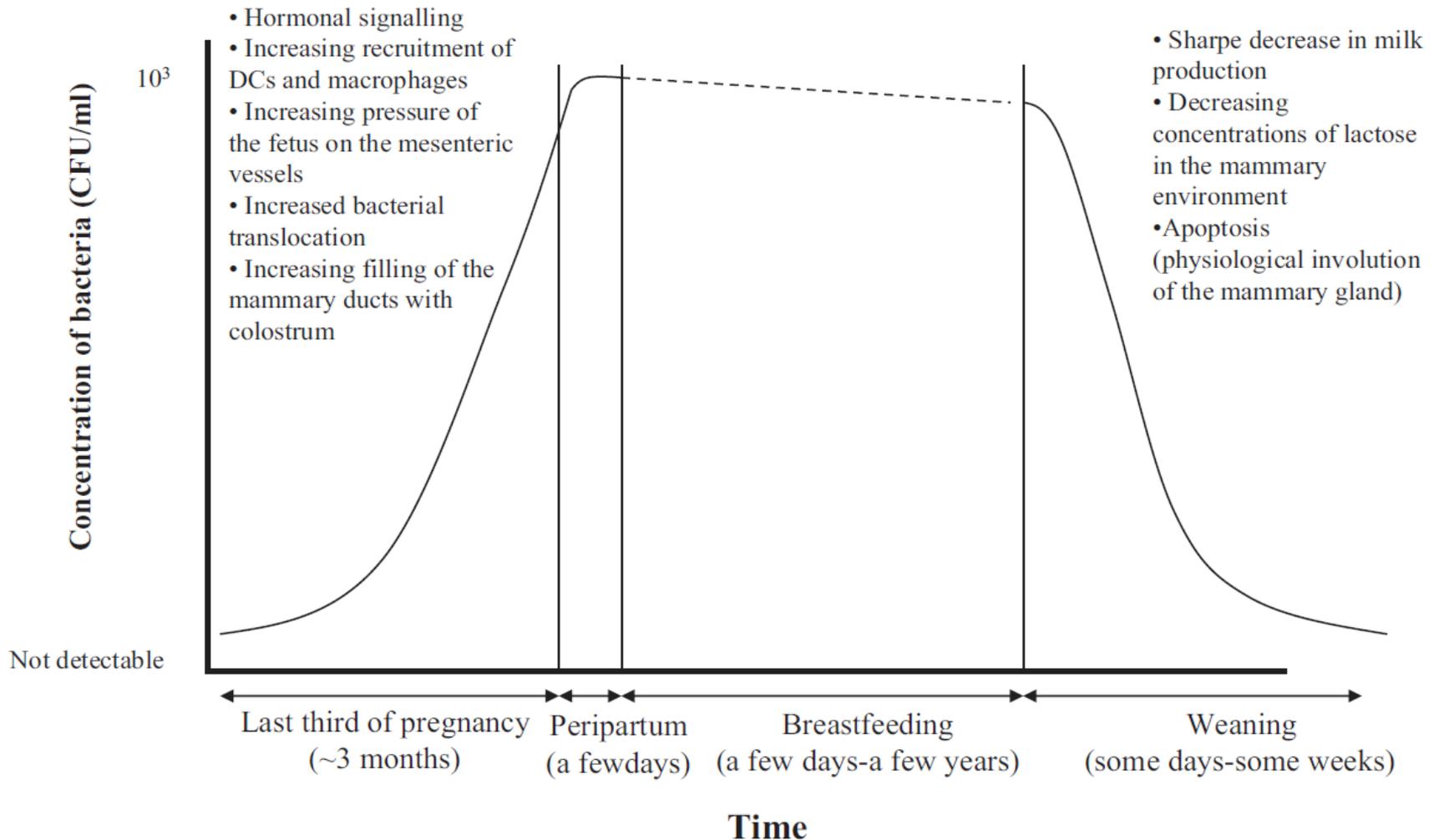
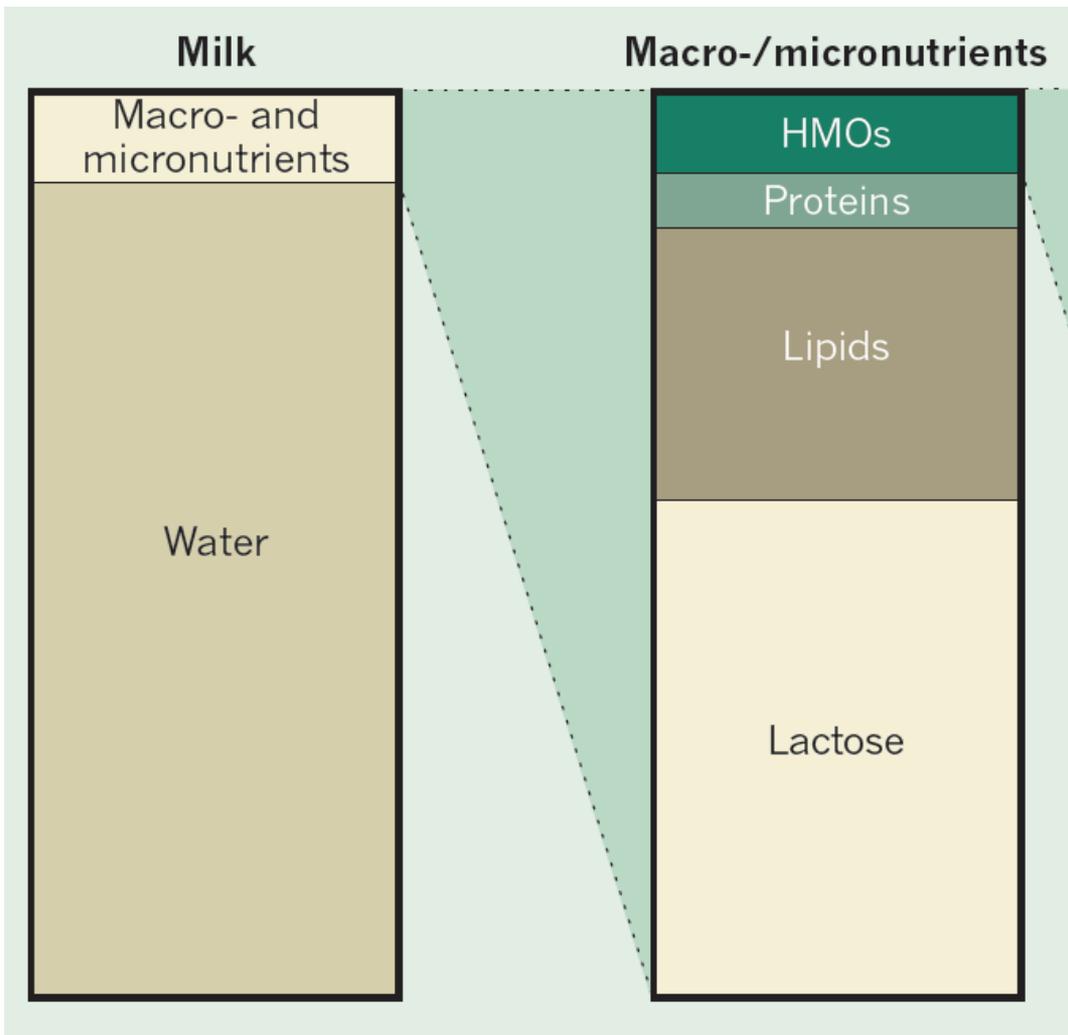


Fig. 1. Schematic representation of the acquisition and development of the human mammary microbiota.



Oligosaccharides in human milk (HMOs) and their prebiotic function

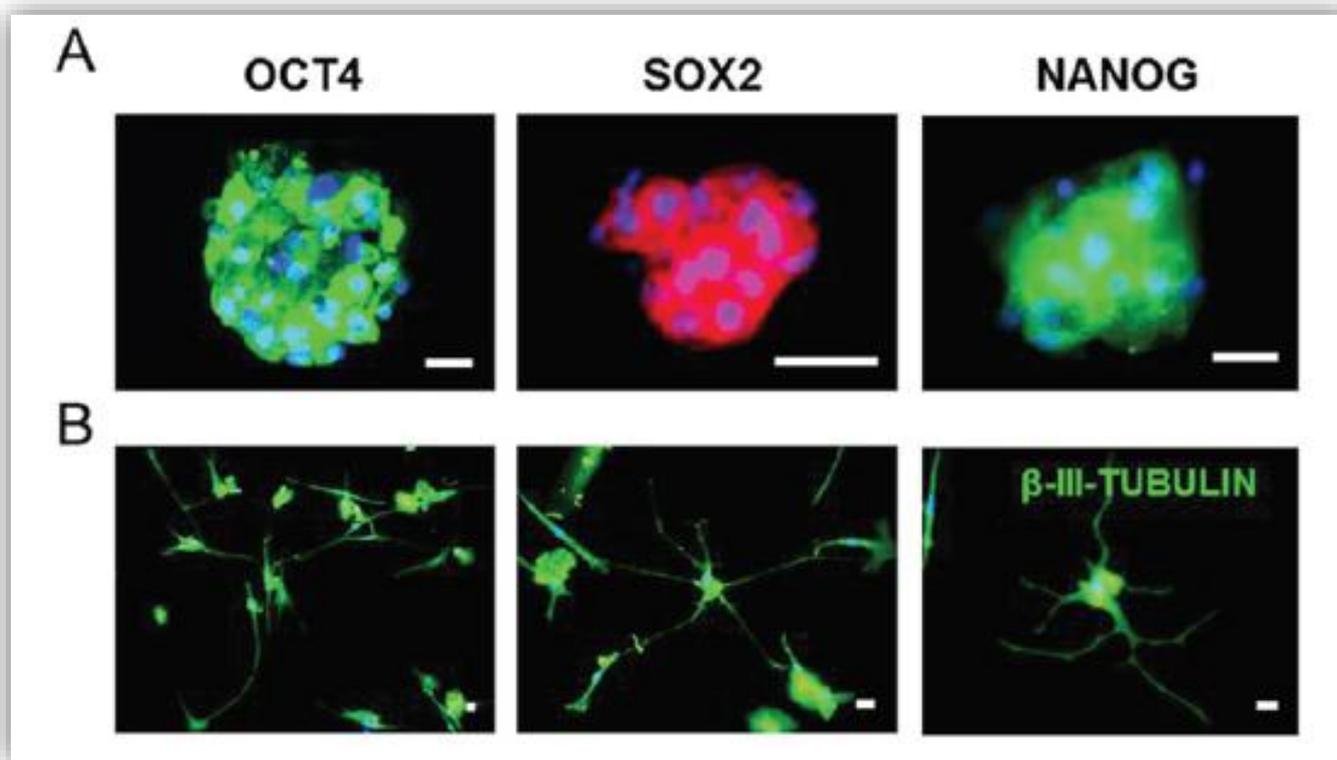


- HMOs are food for friendly bacteria, particularly the gut microbiota
- Shorter chain HMOs in colostrum are almost entirely consumed by *Bifidobacterium infantis*, protecting the newborn from diarrhea.
- HMOs vary in quantity and quality according to the baby's needs





Breast milk and stem cells

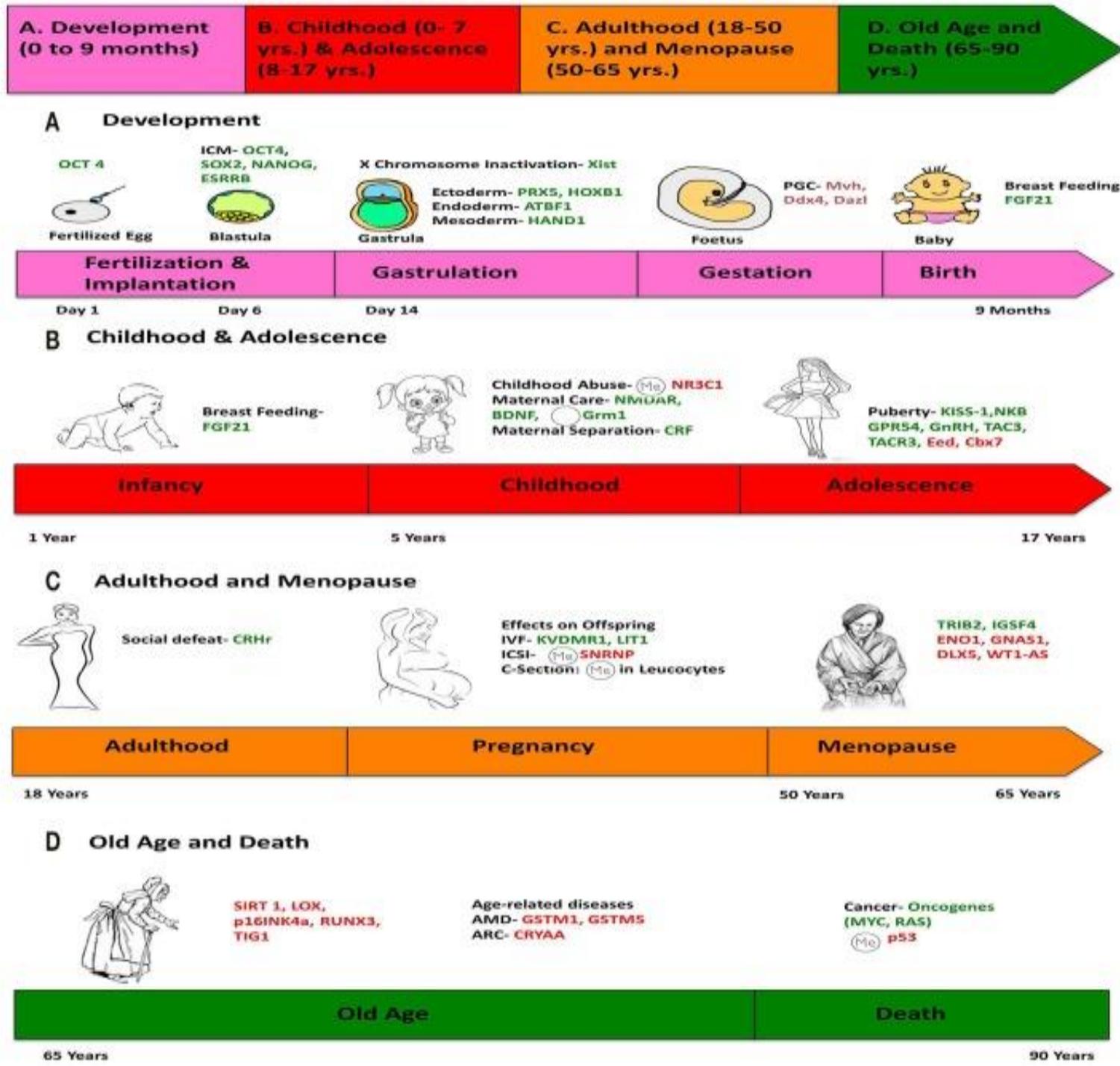


A. HBSC cultured as spheroids. B. Neuron-like cells differentiated from HBSC

Twigger, 2013. Hassitou, sept 2015



Chronology of epigenetics during the life of a woman



Kanherkar R.R. et al. Epigenetics across the human lifespan. *Front Cell Dev Biol.* 2014; 2:49.



WHO-UNICEF recommendations for a healthy start in life

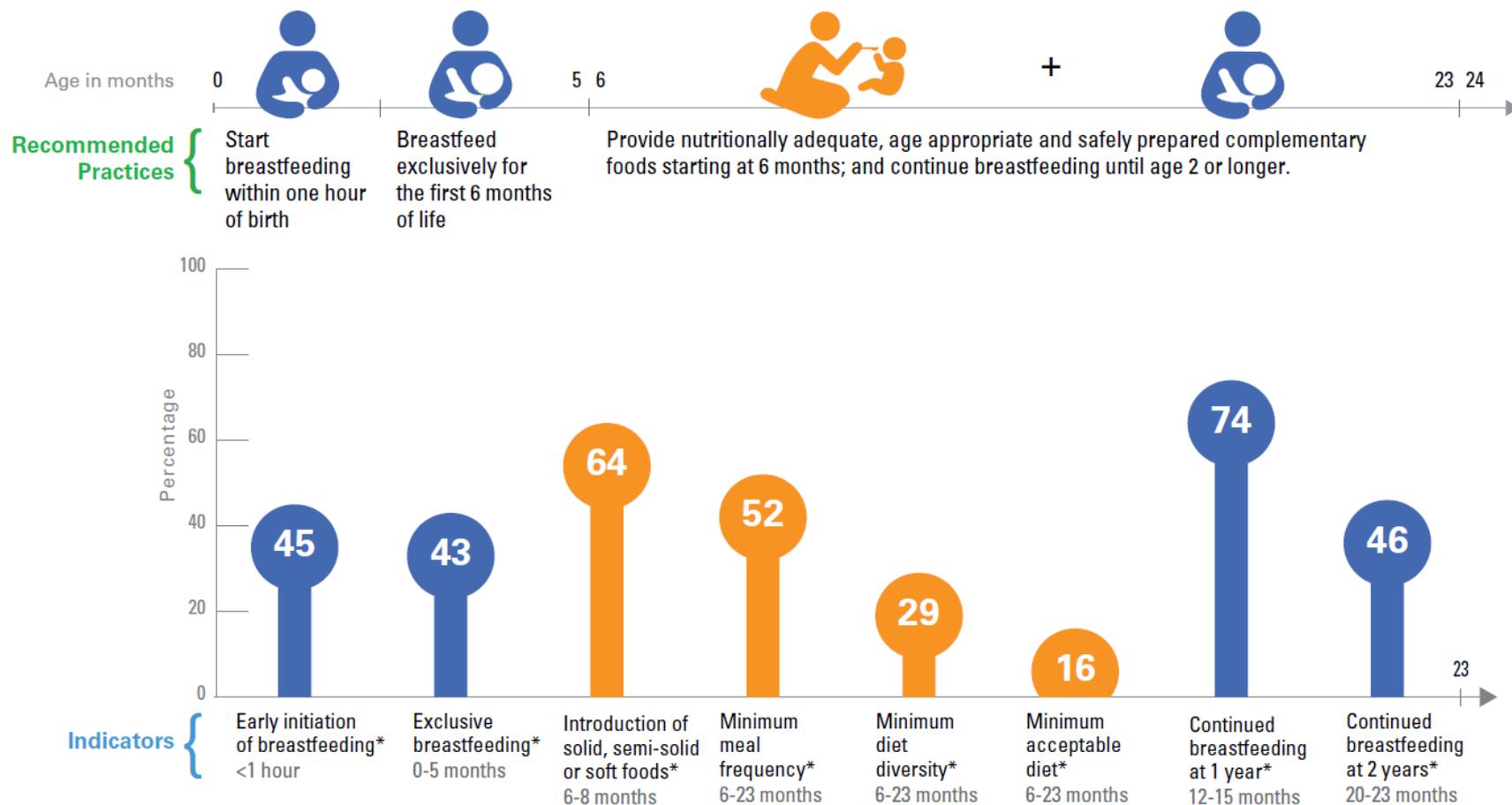
1. Place babies in **skin-to-skin contact with their mothers immediately following birth for at least an hour** and encourage mothers to recognize when their babies are ready to breastfeed, offering help if needed.

In Italy, only 40% of babies are breastfed within the first hour of life (ISTAT, 2015)

2. Exclusively breastfeed infants for the **first six months** to achieve optimal growth, development and health. Thereafter, they should be given nutritious complementary foods and continue breastfeeding **up to the age of two years or beyond**, if mutually desired.



If the world was issued a scorecard for the way its infants and young children were fed it would receive a failing grade



Per cent of children: put to the breast within one hour of birth, exclusively breastfed (0-5 months); introduced to solid, semi-solid or soft foods (6-8 months), with a minimum meal frequency, minimum diet diversity and minimum acceptable diet (6-23 months) and continued breastfeeding at 1 year (12-15 months) and 2 years (20-23 months), 2015.



The health norm



PHILIPS
Easy Care
Adult Long

Up



Motherhood and
feminist movements





We grew up in a strong patriarchal and sexist system.

The women's movement of the Seventies has deserted maternity. The dominion on the female body was powerful, and fascism was not so far from memory, with its rural, prolific and sacrificial mother cult.

What could be more subversive than refusing maternity? If nature had made us slaves, culture would have made us free.

- **Motherhood was a *hot potato*. It was excluded from the debate, as an involuntary and regressive choice** to take care only to get rid of it or to find reconciling formulas with the rest of life - nurseries for access to work, contraceptives and abortion rights for a free self-determination, formula feeding for not being relegated to the private and in the role of care giver.
- **The feminist movement did not claim and did not recognize pregnancy and childbirth as formative experiences, personal growth, self-discovery.**

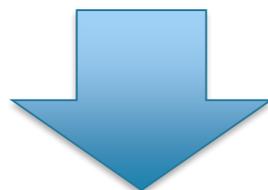
Source: Marzia Bisognin. [Maternità e femminismo](#). 2014





A matter of equity

Worse health outcomes



women with low literacy level
and socio-economic status
and
their babies and children

Empowered women yield better health for themselves
and for their entourage





Conclusions

- Protect, promote and support physiology of the primal period
- Policy makers and health sector should ensure action to promote effective and respectful care during pregnancy, childbirth and the first 1000 days (e.g. WHO/UNICEF BFHI&BFCl and Mother-friendly care)
- Create health-supporting environments, thereby also making healthy choices easier choices for women
- Women's right to make their own «best choice»





Thank you for your attention

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