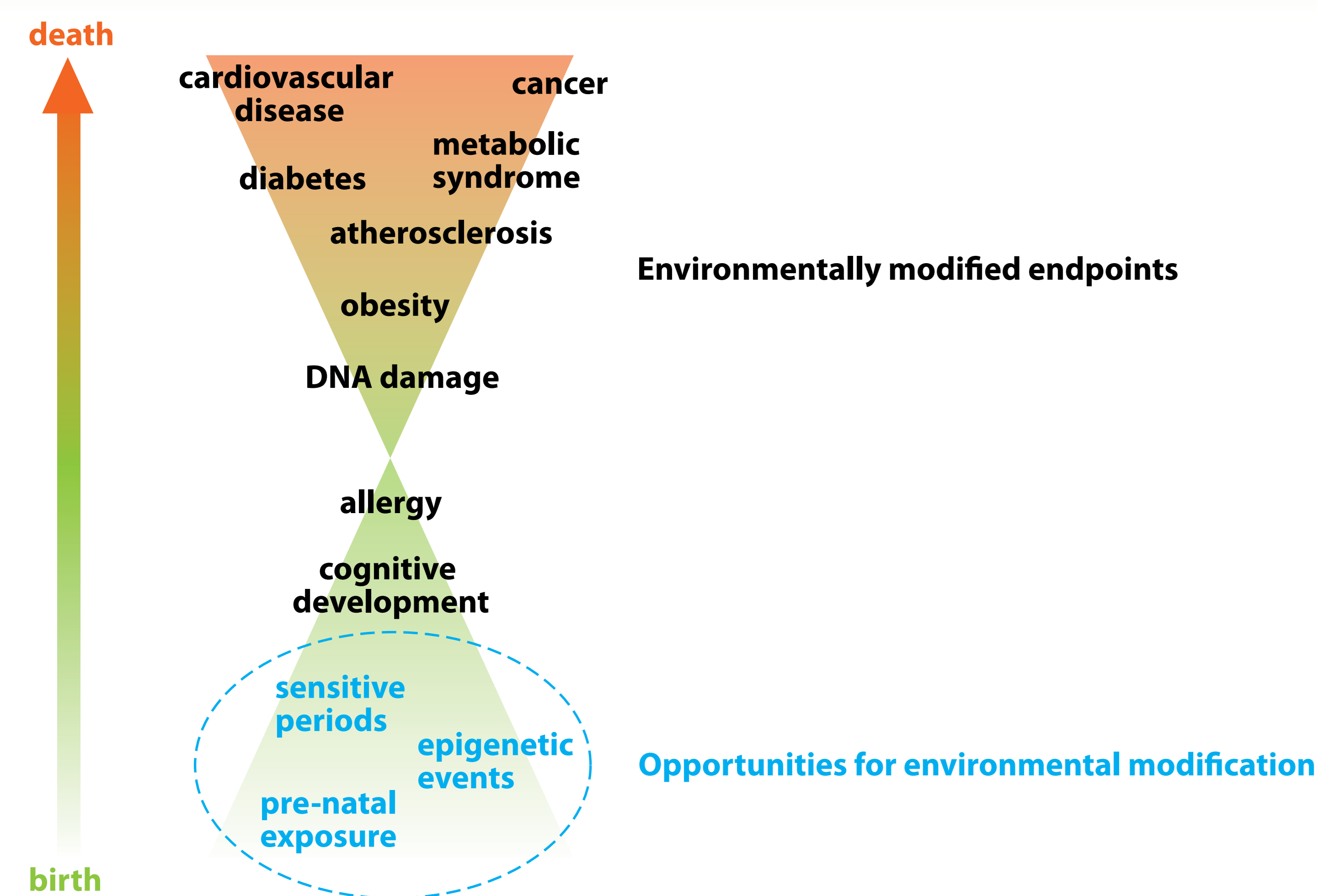


# METABOLIC IMPRINTING, PROGRAMMING AND EPIGENETICS

## A review of current priorities and future opportunities

### BACKGROUND

- ▶ Diet during pregnancy and infancy represents an intervention during a developmentally crucial period
- ▶ The effect of certain dietary components appears to have an effect after the initial exposure has ceased
- ▶ Functional endpoints affected include metabolic syndrome, hypertension, atherosclerosis and mental/cognitive function



### DEFINITIONS

- ▶ Programming – alterations in nutrition and growth at specific developmental points resulting in long term or even permanent effects (Lucas)
- ▶ Imprinting – the basic biological phenomena that putatively underlie relations among nutritional experiences of early life and later diseases (Waterland)



### TASK FORCE DISCUSSIONS

#### Programming

A dynamic process in which a nutritional or other programming stimulus exerts a long term metabolic effect when applied at a critical or sensitive period or periods.

#### Imprinting

A process by which specific genes are genomically imprinted (so far some 80 have been proposed). The results of this imprinting process could lead to programming effects mediated by these genes.

### NEXT STEPS

- ▶ Are there possibilities for nutritional interventions?
- ▶ Is there a role for personalised nutrition products?
- ▶ Can policy recommendations for optimal nutrition be developed for groups of the population?
- ▶ Are there trans-generational effects?
- ▶ What are the best potential practical applications?

### OBJECTIVE

- ▶ To define the terms metabolic imprinting, programming and epigenetics
- ▶ To provide insight into the effects of diet on later life through the interaction of food and its components with different phases of metabolic imprinting/programming
- ▶ To assess if these effects are reversible by later intervention
- ▶ To provide data on optimal dietary constituents for beneficial health endpoints



#### THE METABOLIC IMPRINTING TASK FORCE MEMBERS

- Dr. Bryan Hanley, Martek
- Dr. Laurence Bussière-Sadoury, Groupe Danone
- Dr. Jan Guerts, Friesland Foods
- Dr. Michele Kellerhals, Coca-Cola European Union Group
- Dr. Catherine Macé, Nestlé
- Dr. Ric van Tol, Mead Johnson Nutritionals
- Dr. Renate Zwijsen, Numico
- Ms. Fiona Samuels, ILSI Europe

#### EXPERT GROUP ON DEFINITION AND MECHANISMS OF METABOLIC IMPRINTING, PROGRAMMING AND EPIGENETICS

- Dr. Mary Fewtrell, Institute of Child Health, London
- Prof. Alain Grynberg, INRA, Paris
- Prof. Berthold Koletzko, University of Munich
- Prof. Michael Symonds, University of Nottingham
- Prof. Robert Vlietinck, University of Leuven

#### FOR FURTHER INFORMATION

- Scientific programme of the metabolic imprinting task force – please contact: Fiona Samuels: [fsamuels@ilsieurope.be](mailto:fsamuels@ilsieurope.be)
- For becoming a member of ILSI Europe – please contact: Ruth Marquet: [rmarquet@ilsieurope.be](mailto:rmarquet@ilsieurope.be)
- For publications and press enquiries – please contact: [publications@ilsieurope.be](mailto:publications@ilsieurope.be)

#### OTHER RELATED ILSI EUROPE TASK FORCES

- Nutrition and Immunity
- Functional foods
- Metabolic syndrome and diabetes
- Nutrition and mental performance
- Nutrient requirements
- Probiotics
- Prebiotics

More information available at <http://europe.ilsio.org>