



A HEALTHY START AND LIFE COURSE FOR ALL



GRAND CHALLENGE

CITIZEN HEALTH AND WELLBEING

MISSION

A HEALTHY START AND LIFE COURSE FOR ALL

Evidence-based and context-driven child and parent care for all European citizens starting in Rotterdam by 2030

AREAS OF INTEREST & CROSS-SECTOR

Medical & Public Health Sector

Social Sector

Services Sector

Local & National Governments

Tech Sector

Consumer Sector

Food Sector

Behavioral Sector

R&I PROJECTS

Personalized context-driven approaches for a healthy pregnancy and childhood

Digital nutrition and lifestyle support tools for a healthy pregnancy and childhood

Translation into socio-economic standards & caregiving and welfare approaches

Better understanding of the impact of external factors on early child development before and after birth

Network medicine to understand the origin of diseases early in life

1 Bold, inspirational with wide societal relevance

Based on years of research, we know that health and risk of disease during life is also determined by the health status of the parents before conception, healthy intra-uterine growth and development, and health of the children during infancy and school-age years¹. Now that the rise in life expectancy for European citizens is slowing down and about 20% of their life course is associated with illness², early life offers a great window of opportunity to strengthen the foundation for a healthy life course for new generations and their parents. This requires focusing research and innovation (R&I) on the health of people rather than on diseases only.

There is a substantial body of evidence showing that nutrition, lifestyle and the use of medicine, alcohol, hard and soft drugs and tobacco by the parents before, during and after pregnancy has a serious impact on the physical and mental health of their child, not only at the start of life but during the entire life course. Other risk factors that negatively impact the development of a child before and after birth include socioeconomic status, parental health and early-life exposure to stress, physiological distress, and environmental health threats such as air pollution, climate change and endocrine disruptors. Interventions targeting these risk factors can prevent an unhealthy start and the associated development of diseases later in life for the new-born, while in parallel contributing to a better health of the mother and father.

Diseases known to be associated with health problems in the offspring of affected individuals, or even known to prevent a patient to become a parent, need special attention. In this context, the increasing parental age of first pregnancy and male infertility poses a growing challenge for Europe.

While the importance of parental health for the health of a new-born is widely acknowledged^{3,4,5}, many families in the EU are still devoid of effective prenatal, perinatal and child care^{6,7}. This current situation is further complicated by significant disparities in a healthy life and access to healthcare that are related to socioeconomic status.

2 A clear direction: targeted, measurable and time-bound

The challenges outlined above ask for evidence-based and precision, context-driven solutions. A network medicine approach considering genetic, biological, clinical, (psycho)social and environmental networks in parallel will enable the identification and understanding of the interaction of external factors with the development of health and disease at the start of life. This new knowledge will provide evidence that can be translated into interventions. By taking the context of the individual citizen into consideration, these interventions can be personalised and targeted towards specific challenges and needs. Rotterdam will serve as a front-runner region for Europe in studying the importance of a healthy start and developing and implementing evidence-based and context-driven interventions.

¹ <https://dohadsoc.org/wp-content/uploads/2015/11/DOHaD-Society-Manifesto-Nov-17-2015.pdf>

² OECD/EU (2018), Health at a Glance: Europe 2018: State of Health in the EU Cycle, OECD Publishing, Paris https://doi.org/10.1787/health_glance_eur-2018-en

³ Global Consultation on Child and Adolescent Health and Development. A healthy start in life. Geneva: World Health Organization; 2002

⁴ Stephenson J, et al. Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. Lancet. 2018;391:1830-1841

⁵ Fleming TP, et al. Origins of lifetime health around the time of conception: causes and consequences. Lancet 2018;391:1842-1852

⁶ <https://www.womenpoliticalleaders.org/moving-forward-maternal-health-europe/>

⁷ Barker M, et al. Intervention strategies to improve nutrition and health behaviours before conception. Lancet 2018;391:1853-1864

This city faces significant challenges having deprived areas that deal with a high prevalence of risk factors for an unhealthy start of life and associated high rates of perinatal morbidity and mortality⁸. The target of the Hub mission is that the majority of babies born in Rotterdam are provided with a healthy start through evidence-based preconception, perinatal and early childhood care by 2030, with the ultimate aim to improve health during the entire life course for the next generation of Rotterdam citizens by 2050. The Rotterdam best practices can be shared and adapted to local requirements throughout Europe, in this way enabling a healthy start for the next generations of European citizens.

3 Ambitious but realistic research & innovation actions

To reach the mission targets and provide a healthy start in life for all, research and innovation addressing the full knowledge chain is necessary. Insights from fundamental research on the impact of early life stressors on the development of life to more translational or clinical insights on how early life stressors undermine the physiological systems⁹, as well as better insights on effective implementation, and facilitation of integrated measures for poverty reduction, behavioural change and effective policy are essential. Translating knowledge-based insights into policy in a joint and integrated effort with local and national governing bodies is essential to reach the mission targets.

4 Cross-disciplinary, cross-sector and cross-actor innovation

Family life, pregnancy and birth are at the basis of society. This mission therefore asks for effective multi- and interdisciplinary approaches. It requires bringing together biomedical, clinical, epidemiological and social scientists, biomedical engineers, healthcare professionals, social caregivers, technology professionals including ICT, citizens, industry and national and local governments. They will need to work together across sectors including biomedical & life sciences, behavioural economics, sociology, consumer goods, media and so on. Population- and hospital-based cohorts with data and biomaterials will be at the core of cross-disciplinary research involving Artificial Intelligence as a key enabling technology.

5 Promote multiple, bottom-up solutions

The fact that a healthy start in life for all is truly at the centre of society makes that this mission can only be addressed by considering multiple elements simultaneously that each have their specific contribution and reinforce each other. Basic and translational research will result in innovation followed by implementation of evidence-based approaches. This will enable true societal valorisation of knowledge, i.e. bringing new solutions and interventions to patients and society, in this way stimulating e.g. positive behavioural change in (future) mothers and fathers.

A HEALTHY START AND LIFE COURSE FOR ALL RESEARCH FUNDING LINES:



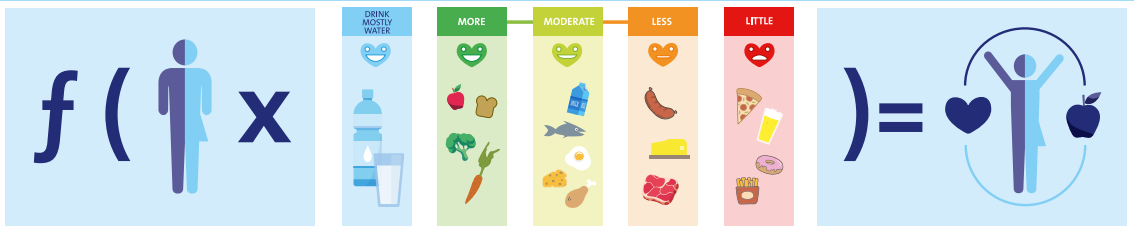
Integrated contextual healthy start approaches to improve health and well-being



How life course acts on genes and how genes act on life course



Healthy start for a healthy life course through data approaches



Healthy start for a healthy life course through nutrition approaches

⁸ Waelput AJM, et al. Geographical differences in perinatal health and child welfare in the Netherlands: rationale for the healthy pregnancy 4 all-2 program. BMC Pregnancy Childbirth 2017 Aug 1;17(1):254.
⁹ <http://developingchild.harvard.edu/wp-content/uploads/2010/05/Foundations-of-Lifelong-Health.pdf>

THE IMPACT WE WANT TO MAKE: 'A HEALTHY LIFE COURSE FOR ALL!'

Erasmus Medical Centre wants to enable health and a healthy life course for all!

We are using transdisciplinary approaches to develop strategies for prediction, prevention, and precision medicine that can be employed to solve current as well as emerging health challenges. It is how we impact the lives of healthy citizens and patients through our networks and collaborations.

We are an academic hospital with the DNA of Rotterdam, an academic hospital that walks the talk.

