Assignment 11

The Green Baby Project: Development of a Sustainability Model to Assess the Environmental Footprint of Medical Care and Technology for Child Birth and Early Human Life

Problem statement

Modern medicine requires innovative strategies to achieve high value and sustainable outcomes for both patients and the environment, against increasing health care costs, use of materials and other sources of waste. This has become ever more evident during the COVID-19 pandemic, when strategies were rapidly developed to reduce considerable waste and environmental impact on the planet while protecting population health.

To help inform decisions on health policy, guide the development of new technology, better monitor treatments and listen to the needs of patients born into a world of rapidly evolving climate change, we need to develop reliable models for estimating the CO2 footprint of the care we wish to provide, the technology we use, the short-term and long-term effects of treatment on the environment. This will then allow us to identify critical points in the process that are best suited for redesign to reduce the visible impact (material use, waste production), hidden impact (e.g. production processes prior to material use, life cycle assessment) and improve the sustainable nature of care itself (e.g. prevention of complications, need for interventions, healthy childhood development). In the Green Baby project, we aim to develop these models for a number of use cases involving medical care and technology around the time we are born. This project is a collaboration between the Institute for Fetal and Neonatal Care and the Centre for Sustainability, as part of the Medical Delta, and will benefit from the access to real-world data from the Dutch Perinatal Registry, as well as highly detailed data from the Erasmus MC maternity and neonatal Intensive care units.

Research question(s)

What Is the CO2 footprint and environmental impact of medical care and technology around the time of birth? Development and validation of sustainability models for child birth and neonatal care.

Expected type of work

Critical appraisal of literature. Development and validation of a Greenbaby tool to assess the environmental Impact using real-world data on an Individual and national level (Big data). Working out 1-3 use cases for testing the modelling tool.

Available data/reports or other relevant information sources for the assignment

1. Dutch Government, 2021. https://www.rijksoverheid.nl/onderwerpen/duurzame-zorg/meer-duurzaamheid-in-de-zorg
2. Van Straten B et al. A life cycle assessment of reprocessing face masks during the COVID-19 pandemic. Sci Rep. 2021 Sep 3;11(1):17680. https://doi.org/10.1038/s41598-021-97188-5
3. Been JV et al. Impact of COVID-19 mitigation measures on the Incidence of preterm birth: a national quasi-experimental study. Lancet Public Health. 2020 Nov;5(11):e604-e611.
4. https://www.lunduniversity.lu.se/article/four-lifestyle-choices-most-reduce-your-carbon-footprint
5. B. Porcelijn & CE Delft. 2017. The Hidden Impact. https://thinkbigactnow.org/en/