Born Green Generation

Born Green Generation: Why and How

www.borngreengeneration.org

We believe all babies should be born in healthcare environments free from unnecessary and harmful plastics and toxic chemicals – so that all children have a fair chance to thrive.

Contents

Born Green Generation Initiative

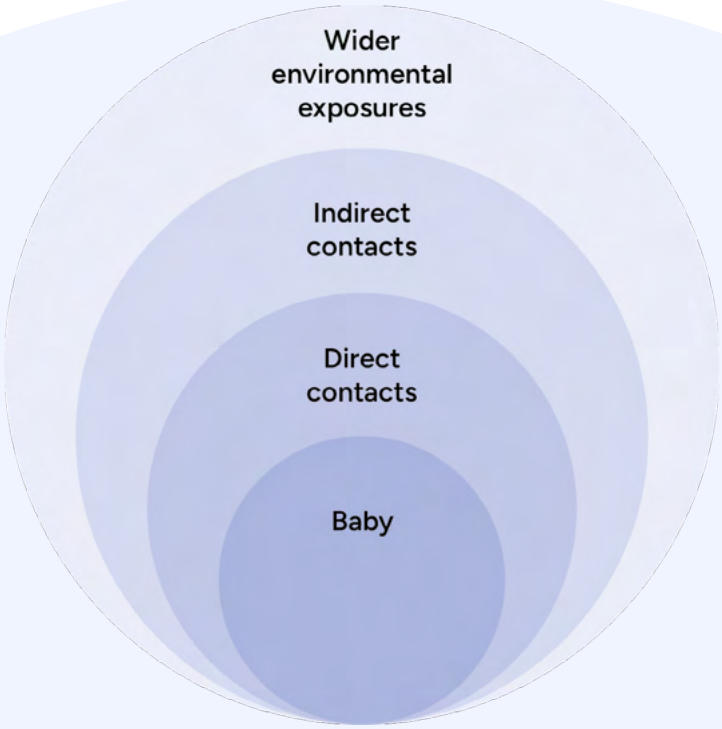
About the project

Building on the success of HCWH Europe's previous project, *Towards plastic-free healthcare*, Born Green Generation is a movement, with the aim of protecting babies during their first 1,000 days from the harmful effects of plastics and chemicals – while reducing unnecessary consumption and promoting a circular economy in healthcare settings. The goal is to demonstrate that healthcare free from unnecessary plastics and toxic chemicals is possible and can be the global norm for generations to come.

In partnership with four leading European healthcare providers, over the course of three years we will embark on a journey to phase out unnecessary plastics and toxic chemicals, through the co-design of a framework comprising an assessment tool, implementation tool and educational resources developed with our university partner.

The framework will sit across three pillars, shifting culture, innovating practice and transforming policy, that will help drive transformation and be continually evaluated and improved with our stakeholders. Innovations implemented in our clinical partner sites will then be added to our collection of best practice case studies to become an inspirational example for others to follow and build upon.

In order for the Born Green Generation project to be successful, babies need to be protected from the health risks plastics and harmful chemicals pose. To do this, products and consumables must be assessed not only for the materials they are made of but also for how they are utilised and what contact or exposure a baby has.



Toxic consumables which have **direct contact** with a baby pose the largest risk, e.g. microplastics entering the digestive tract, medications, equipment utilised in the body and products which have dermal contact with the baby. These are priority focus products for the Born Green Generation project, and examples of mitigating these exposures are being compiled as best practice case studies.

Consumables, which are single-use plastics or made from endocrine-disrupting chemicals (EDCs) to which a baby is not directly exposed, but the pregnant mother is, or a consumable included in a care pathway, are also being addressed as an **indirect exposure** to the baby.

Assessing the necessity of these products also reduces the quantity and volume of consumables procured and enters waste streams, which has both environmental and financial benefits for the healthcare provider.

Some case studies also reflect the **wider environment** that babies experience during their first 1,000 days, such as air quality and cleaning products in a healthcare setting.

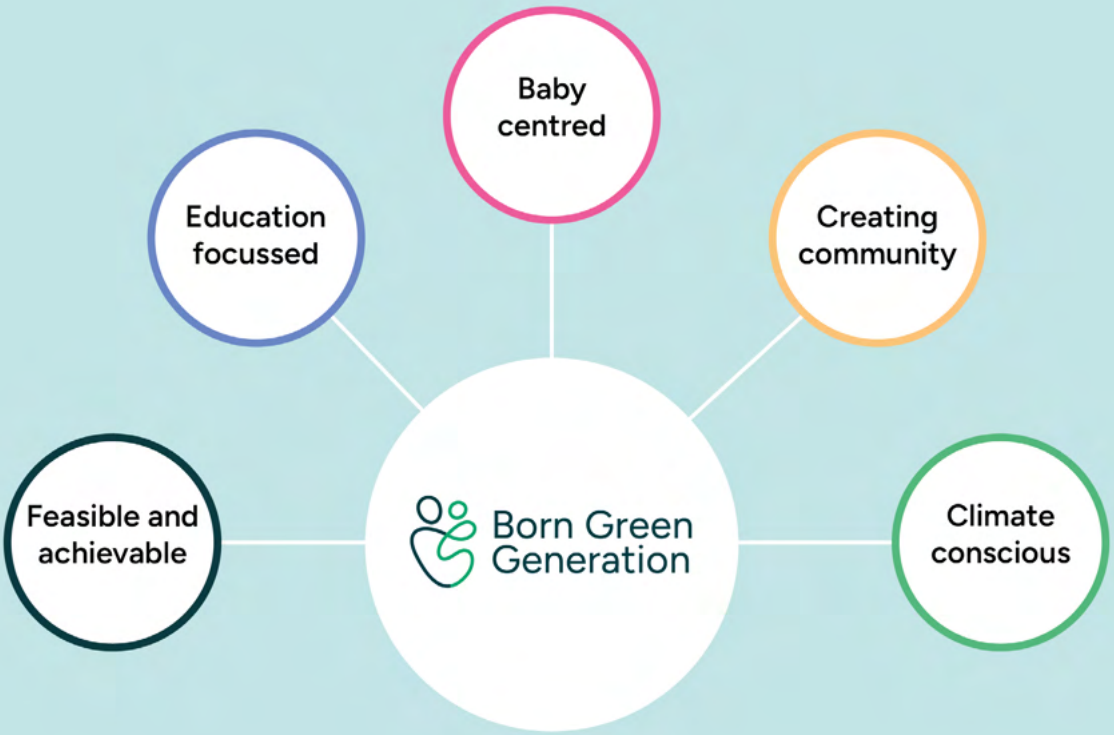
Our clinical partner, Centre Hospitalier d’Angoulême has introduced ready made formula milk in glass bottles after collaboration with their supplier.

For mothers who use formula, this eliminates the risk of endocrine-disrupting chemicals (EDCs) leaching from plastic bottles into the baby’s milk, especially when it is being warmed.

The Born Green Generation Framework

The Born Green Generation team at HCWH Europe are developing a framework in collaboration with key stakeholders - our five clinical and academic partners, Steering Committee and Infection Prevention and Control (IPC) Advisory Board.

The framework is a selection of tools and resources developed to support hospitals joining the movement to identify opportunities for removing unnecessary plastics and harmful chemicals during the first 1,000 days. Each element of the framework is developed to be utilised and complementary with the other products to enable the identification of key areas of implementation and to support the education, training and cultural shift needed for lasting impact.



Key principles

During the development of the Born Green Generation framework, five interconnected themes emerged as key principles to underpin the framework and innovations for those joining the movement. These principles are:

Feasible and achievable

For effective and practical implementation, changes must be concise and straightforward to avoid detracting from the care needs of the baby and family. By concentrating on simple interventions and implementing them effectively, there is greater potential for success and replication by other providers for scale and spread.

Education focussed

Clinicians and policymakers alike need to understand the health risks of exposure to EDCs from plastics and other harmful chemicals has during the first 1,000 days, as well as the safer alternatives available. The success of the Born Green Generation initiative supports raising awareness and understanding to ensure effective culture shifts and innovation.

Baby centred

Ensure patient safety and clinical governance are at the core of the project while prioritising individualised care for the baby and their family.

Creating community

The movement is supported to grow and spread through a shared common ambition, connectivity across specialities throughout the continent, sharing successes, and learning from the partners piloting changes.

Climate conscious

While the focus is on the health, well-being, and safe development of the baby during their first 1,000 days, Born Green Generation innovations support wider net zero and sustainability ambitions, ensuring changes do not have detrimental effects on the wider environment for others.

Assessment tool

Developed around the three core pillars of the project, The Born Green Generation assessment tool will help a ward or clinical team evaluate their current position regarding risk and exposure of avoidable plastics and harmful chemicals to babies.

The assessment tool is intended to be completed by a multidisciplinary team (MDT) who are working together to embed the Born Green Generation initiative into their clinical setting. Once completed, the results will highlight key areas of focus for the team to prioritise their efforts.

The assessment can be revisited at a later date to monitor progress made. If the complete MDT cannot contribute, the tool will still provide insights and direction that an individual will be able to implement change within one of the pillars.

Implementation tool

Building upon the experiences and best practice case studies our clinical partners are currently piloting. The Born Green Generation Implementation Tool will be a compilation of resources to support circular procurement and practices and reduce single-use plastics and toxic chemicals in healthcare when caring for babies.

Having identified hotspots from the assessment tool it will provide practical solutions and guidance to design effective and measurable improvements to reduce plastics and toxic chemicals from care pathways during the first 1,000 days.

Training resources

With our academic partner, 10 modules (worth 2 ECTS) are being developed to support the cultural shift of the Born Green Generation initiative.

With a range of content and learning activities, the modules incorporate the triple planetary crisis, an introduction to circular economy and circular strategies in healthcare, health risks associated with plastics and chemicals, and life cycle analysis.

These modules are ideal for those pursuing careers in healthcare at the bachelor level and existing healthcare professionals who wish to expand their knowledge.

Background

There is international agreement that the climate crisis poses the biggest threat to human health, with an estimated 13 million deaths attributed to avoidable environmental causes (WHO, 2022).

Year after year, The Lancet Countdown report highlights how climate change exacerbates food insecurities, health impacts from extreme heat exposure, social inequalities, risk of vector-borne infections, as well as threats to life as a consequence of natural disasters (The Lancet Countdown, 2024). Due to existing gender-based inequalities, women and children are also at increased risk of the health impacts caused by the climate crisis (UNICEF, 2021; WHO, 2023).

While efforts to reduce carbon footprints are growing, addressing the immediate health risks of toxic exposure in healthcare settings remains an urgent priority. We stand at a pivotal moment in healthcare.

While the climate crisis is widely recognised as a major threat to human health, another critical issue often goes overlooked: the prevalence of endocrine disruptors in healthcare environments. Found in plastics, medical devices, and everyday products, these harmful chemicals have been linked to serious health problems such as hormone imbalances, cancer, diabetes, and respiratory conditions.

A study of over 2,000 cases found young children's exposure to phthalates, a common plastic additive, increased childhood cancer rates by 20% (Strotmeyer, K. 2022).

Plastics, chemicals and endocrine disruption

Plastic has become ubiquitous in healthcare, dramatically shifting towards single-use items in recent decades with a reliance on convenience and procurement savings. The healthcare sector's reliance on single-use plastics (SUPs) contributes to the continued demand for these products and the practices involved in their production.

It is widely accepted that a significant amount of consumables in healthcare settings not only contribute to the wider climate crisis due to their manufacturing, transport and waste management but can be detrimental to health at the point of contact with a patient.

SUPs have been normalised within healthcare settings in many forms, including medical instruments, medication containers, packaging, and food containers, to name a few. However, the awareness of the impact these plastics have upon the health of patients at the point of care is not as widely known amongst clinicians as it should be, and efforts to minimise their use have not reached their full potential.

Why are plastics the problem?

What's in them?

The endocrine system controls all hormones and chemical regulations within the body; these help balance sleep patterns, immunology, blood composition, organ function and cognitive ability. Disruptions to these, therefore, impact the functionality and health of the body and have been linked to diseases, including cancers, diabetes, and asthma.

There is increasing evidence that recent epidemics such as obesity, metabolic disorders such as type 2 diabetes, liver, kidney and cardiac diseases may also be a result of prolonged exposure to a group of endocrine-disrupting chemicals that interfere with hormonal production and function (Heindel, et al. 2016).

Some of the most prevalent plastics in healthcare and their applications[1]:

Bisphenols

Applications:

Polycarbonate plastic containers including plastic baby bottles.

Bisphenol A (BPA) is banned for use in plastic baby bottles in the EU. Products labelled "BPAfree", however, can contain alternative bisphenols such as bisphenol S or bisphenol F, which are similar in structure to BPA and can have similar negative health effects.

Health risks:

When heated (such as heating infant milk) chemicals are more likely to leech into the milk and be ingested.

- Reproductive effects (including infertility and miscarriage).
- Cardiovascular diseases, thyroid, immune and metabolic diseases.
- Childhood obesity.
- Neurodevelopment impairments.
- Respiratory diseases.

Phthalates

Applications:

Used as plasticisers, in items made of polyvinyl chloride (PVC).

Paper packaging can contain phthalates.

Health risks:

- Reproductive toxicity, cancer, insulin resistance and type 2 diabetes, obesity, allergies and asthma.
- Antenatal exposure may have neurodevelopmental consequences and damage brain development.
- Associations with birth defects.

[1] The health risks listed are not an exhaustive list and focus on risks which can impact fertility, pregnancy and early years health.

PFAS (Per-and polyfluroalkyl substances)

Applications:
Grease and water resistant coating on paper and cardboard packaging.

Health risks:
- Thyroid disease, increased cholesterol levels, liver damage, renal cancer, lower birth weight, and vaccine resistance.

PVC

Applications:
Found in many patient care products, including catheters, blood bags and giving sets.

Used in a variety of PPE products including gloves, facemasks and aprons.

Often requiring other synthetic chemicals to be added for usability.

Health risks:
- Toxic to health and the environment at all stages of its lifecycle.
- Neurotoxicity, respiratory irritation, immune system suppression, birth defects, impaired child development.

The first 1,000 days

The experiences and environment during a baby's first 1,000 days – from conception to their second birthday – play a crucial role in determining their future health.

During this vulnerable stage of life is when the most rapid period of growth and development occurs, with neurons developing new connections at a rate of 700-1,000 per second (UNICEF, 2017).

Babies can be exposed to harmful chemicals and plastic products in hospital settings, such as disinfectants, plastic gloves and disposable gowns, many of which have safer alternatives. Exposure can lead to severe and lasting health issues (HCWH Europe, 2023), from chronic diseases to diabetes and even cancer, as babies' defence systems are not yet fully developed.

The human immune and endocrine systems do not mature until age 10, with most development occurring before the age of 2 years. Therefore the significance of the first 1,000 days is undeniably important with regards to development but also vulnerabilities and exposure risks.

During this critical time, the health and wellbeing of the mother or birthing person and child during the first 1,000 days has a profound impact on the foundations of health for the rest of the child's life and the following generations. Premature babies are not only more vulnerable to the harmful effects of exposures due to their underdevelopment but also likely to have more contact with medical instruments and devices during an extended admission in a neonatal intensive care unit (NICU) to support their adaptation to life outside of the uterus.

As scientific evidence expands, mainstream media has reported on the discovery of micro and nano-plastics being found in various human tissues and blood samples, as well as in placental tissue (Halfar et al, 2023), amniotic fluid (Xue et al, 2024) and breastmilk (Liu et al, 2023).

The research exploring the health impact of micro and nano-plastics on prengnancy and early years life is still in it's infancy but suggest the impacts are similar to deposits from a smoking mother. They obstruct the oxygen exchange and nutritional transfer functionality of the placenta. Micro and nano plastics may also be responsible for similar blockages in the maternal/fetal exchange barrier, resulting in poor outcomes such as stillbirth, inter-uterine growth restriction (IUGR) (Amereh et al. 2022), small for gestation age (SGA) and premature birth (Xue, et al. 2024), among others.

In a study of 1,105 mothers and their children from across Europe, Statakis et al. (2020) found higher exposure to PFAS during pregnancy was associated with higher liver enzyme and inflammation marker levels in the children, resulting in an increased risk of liver injury and metabolic disorders.

Experts in child health and toxicology consistently highlight the necessity of protecting children, in utero and beyond, from the harmful effects of plastics, PFAS and chemicals as a public health priority.

Get involved

These resources will become available throughout 2025. To keep up to date with Born Green Generation, sign up for the newsletter and pledge your commitment to minimise plastic and reduce exposure to harmful chemicals in babies during their first 1,000 days.

What does it mean to pledge?

1
Sign up

Join the movement by pledging your commitment to a sustainable healthcare environment.

2
Take action

Select actions suited to your role and capacity, with options tailored for healthcare professionals, parents, educators, and more. Implement these changes over the course of one year.

3
Share

Show your progress by submitting updates, photos, and sharing your journey on social media. Earn digital badges based on your level of commitment and actions taken.

Sign up

References

- Amereh, F. Amjadi, N. Mohseni-Bandpei, A. Isazadeh, S. Mehrabi, Y. Eslami, A. Naeiji, Z. Rafiee, M. (2022). Placental plastics in young women from general population correlate with reduced foetal growith in IUGR pregnancies. Environmental Pollution, 314. DOI. (https://doi.org/10.1016/j.envpol.2022.120174)

- ClientEarth. (2024) PVC has lost its shine - what is PVC and why we need to ban it. (https://www.clientearth.org/latest/news/what-is-pvc-and-why-we-need-to-ban-it/)

- Halfar, J. Čabanová, K. Vávra, K. Delongová, P. Motyka, O. Špaček, R. Kukutschová, J. Šimetka, O. Heviánková, S. (2023) Microplastics and additives in patients with preterm birth: The first evidence of their presence in both human amniotic fluid and placenta. Chemosphere, 343. DOI. (https://doi.org/10.1016/j.chemosphere.2023.140301)

- Health Care Without Harm. (2019) Health care climate footprint report. (https://global.noharm.org/resources/health-care-climate-footprint-report)

- Health Care Without Harm Europe. (2021) Sustainable food contact materials in the European healthcare sector. (https://europe.noharm.org/media/4521/download?inline=1)

- Health Care Without Harm Europe. (2023) Towards plastic-free healthcare in Europe. (https://europe.noharm.org/towards-plastic-free-healthcare-europe#Resources)

- Health Care Without Harm Europe. (2024) Manifesto for a Sustainable Healthcare System and Healthier EU Citizens. (https://europe.noharm.org/resources/manifesto-sustainable-healthcare-system-and-healthier-eu-citizens)

- Heindel JJ, Blumberg B, Cave M, Machtinger R, Mantovani A, Mendez MA, Nadal A, Palanza P, Panzica G, Sargis R, Vandenberg LN, Vom Saal F.(2016) 'Metabolism disrupting chemicals and metabolic disorders' Reproductive toxicology (Elmsford, N.Y.), 68, 3–33.

- Liu, S. Guo, J. Liu, X. Yang, R. Wang, H. Sun, Y. Chen, B. Dong, R. (2023) Detection of various microplastics in placentas, meconium, infant feces, breastmilk and infant formula: A pilot prospective study. Science of The Total Environment, 854. DOI. (https://doi.org/10.1016/j.scitotenv.2022.158699)

- Stratakis, N., V Conti, D., Jin, R., Margetaki, K., Valvi, D., Siskos, A. P., Maitre, L., Garcia, E., Varo, N., Zhao, Y., Roumeliotaki, T., Vafeiadi, M., Urquiza, J., Fernández-Barrés, S., Heude, B., Basagana, X., Casas, M., Fossati, S., Gražulevičienė, R., Andrušaitytė, S., ... Chatzi, L. (2020). Prenatal Exposure to Perfluoroalkyl Substances Associated With Increased Susceptibility to Liver Injury in Children. Hepatology (Baltimore, Md.), 72(5), 1758–1770.

- Strotmeyer, K. (2022) Study finds exposure to phthalates may increase children's cancer risk. (https://www.med.uvm.edu/medcommunications/news/2022/03/16/uvm_cancer_center_research_phthalates)

- The Lancet. (2024) The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action. (https://lancetcountdown.org/2024-report/)

- UNICEF. (2017) Early moments matter. (https://www.unicef.org/serbia/en/early-moments-matter)

- UNICEF. (2021) The climate crisis is a child rights crisis. (https://www.unicef.org.uk/climate-change/)

References

- World Health Organisation. (2022) World Health Day 2022. (https://www.who.int/campaigns/world-health-day/2022)

- World Health Organisation. (2023) Protecting maternal, newborn and child health from the impacts of climate change. (https://www.who.int/publications/i/item/9789240085350)

- Xue, J. Xu, Z.Hu, X. Lu, Y. Zhao, Y. Zhang, H. (2024) Microplastics in maternal amniotic fluid and their associations with gestational age. Science of The Total Environment, 920, DOI: (https://doi.org/10.1016/j.scitotenv.2024.171044)

Get in touch

borngreen@hcwh.org

Flotilla FOUNDATION

HCWH Europe gratefully acknowledges the financial support of the Flotilla Foundation. HCWH Europe is solely responsible for the content of this project and related materials. The views expressed do not reflect the official views of the Flotilla Foundation.

Born Green Generation

www.borngreengeneration.org