

GENERATION PLASTIC

Unpacking the impact of plastic on children



Healthy Environments
for Healthy Children

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Generation Plastic

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Generation Plastic draws attention to **five types of hazards** plastics present for children:

1. Toxic exposures from plastic waste
2. Pollution from plastic production
3. Impact of plastic waste on livelihoods and flooding
4. Toxic chemicals in everyday plastic products
5. Knowledge gaps on plastic chemicals and particles

Plastic risks are concentrated among the most vulnerable children



1. Toxic exposures from plastic waste

- Less than 10% of plastics have ever been recycled (Geyer 2020)
- Globally, over 20 million adults and children who work as waste pickers (WHO 2021)
 - They collect approximately 60% of all the plastic gathered for recycling globally
- Some 2.7 billion people do not have their waste collected (Global Waste Management Outlook 2024)
- Around 57% of plastic pollution is estimated to be openly burned each year (Cottom 2024).
- 18 million children working in the industrial sector; unknown but possibly substantial subgroup working in waste management (ILO 2021)



Sorting and collecting items for reuse at a meters-high mixed plastic waste open dump in Freetown, Sierra Leone. Photo courtesy Baskut Tuncak.

2. Pollution from plastic production

- Fossil fuels provide raw materials for 99% of plastics (UNEP 2021).
- Sea, train, and pipeline transportation networks pose additional environmental risks to children living in adjacent communities.
- Release of toxic petrochemicals can reach nearby “fenceline” communities (Minderoo 2023).
- Children from marginalized communities living near natural resource extraction sites face additional social risks (Abramson 2013, Nkem 2022, Proville 2022).



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3. Impact of plastic waste on livelihoods and flooding

- Direct and indirect impacts of plastic waste on children due to livelihood disruptions and flooding has not been assessed
- Oceans: Plastic waste impacts ocean health and causes environmental and economic harms (GESAMP 2021)
 - Habitat degradation; cost burdens to tourism; damage to vessels, fishing gear and facilities, etc (McIlgorm 2023, Beaumont 2019)
 - Especially coastal and island economies
- Agriculture: ingestion of plastic waste by livestock and economic losses to the owner (Ramaswamy 2011).
- Flooding may be aggravated by plastic waste
 - Breeding grounds for vector-borne diseases
- Vulnerabilities: Children's immaturity and dependence on adults & susceptibility to killer infectious diseases



4. Toxic chemicals in everyday plastic products

- Common children's products contain hazardous plastic-associated chemicals – such as phthalates, bisphenols, PFAS, flame retardants, styrene, PVC, crumb tyre infill on playgrounds, and more.
- More than 3,600 plastic-associated chemicals are of potential concern to human health and safety yet are unregulated by global policies (PlastChem, 2024)
- 'Regrettable substitution' has in some cases replaced one hazardous chemical with another equally or more hazardous (e.g., bisphenols, phthalates)



4. Toxic chemicals in everyday plastic products

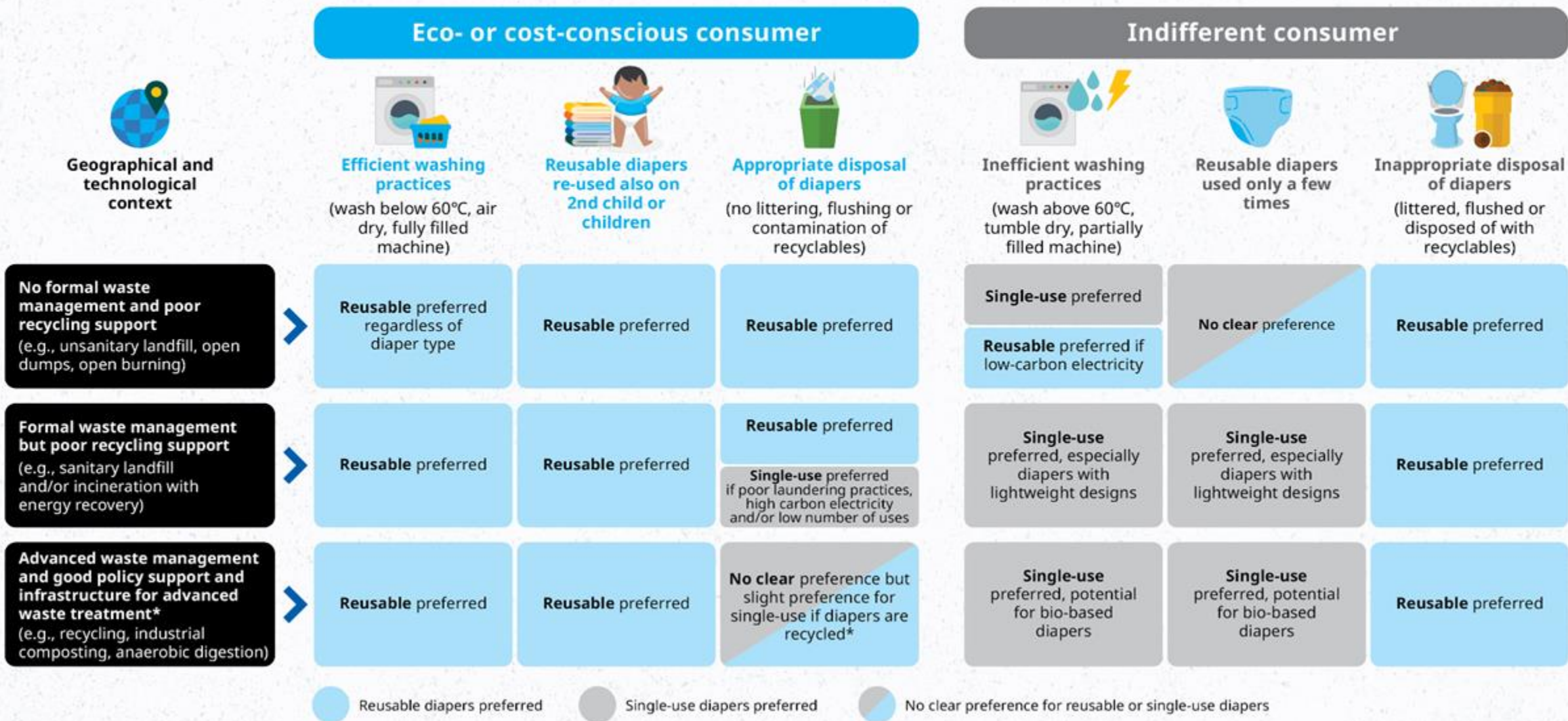


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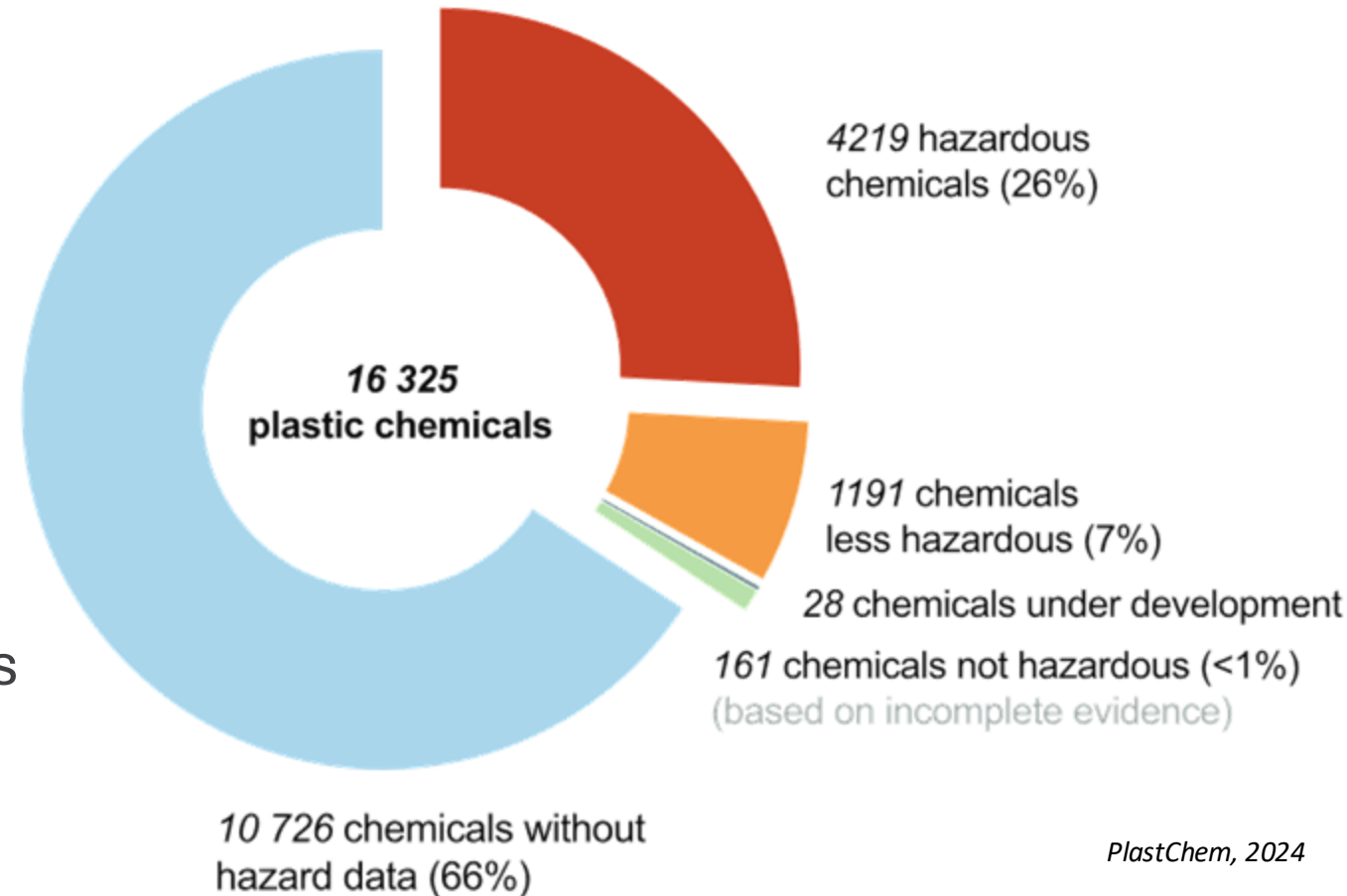
Life cycle assessments of diapers



* Recycling of single-use nappies is yet to be implemented on a large scale, with the main logistical and infrastructural challenges currently being the separate collection and storage of dirty nappies. Recycling and other advanced waste treatment options for single-use nappies have, however, been shown to be technically feasible with good environmental outcomes in pilot studies.

5. Knowledge gaps on plastic chemicals and particles

- Over 16,000 unique chemicals potentially used and present in plastics
- Absorption & potential health effects plastics lack comprehensive post-market monitoring
- Bio-based and biodegradable plastics
- Risk assessment of plastic safety for children lacking



Where microplastics have been documented in the human body





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PLASTICS AND CHILDREN'S HEALTH

Philip J. Landrigan, MD, MSc, FAAP

Director, Program for Global Public Health and the Common Good
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PLASTICS AND CHILDREN'S HEALTH

While the world focuses on plastic waste and its ecological impacts, it is essential to remember also that plastic harms human health.



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While the world focuses on plastic waste and its impacts on the environment, it is essential to remember also that plastic harms human health.

Plastic harms health across its life cycle – production, use, and disposal



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While the world focuses on plastic waste and its impacts on the environment, it is essential to remember also that plastic harms human health.

Plastic harms health across its life cycle – production, use, and disposal

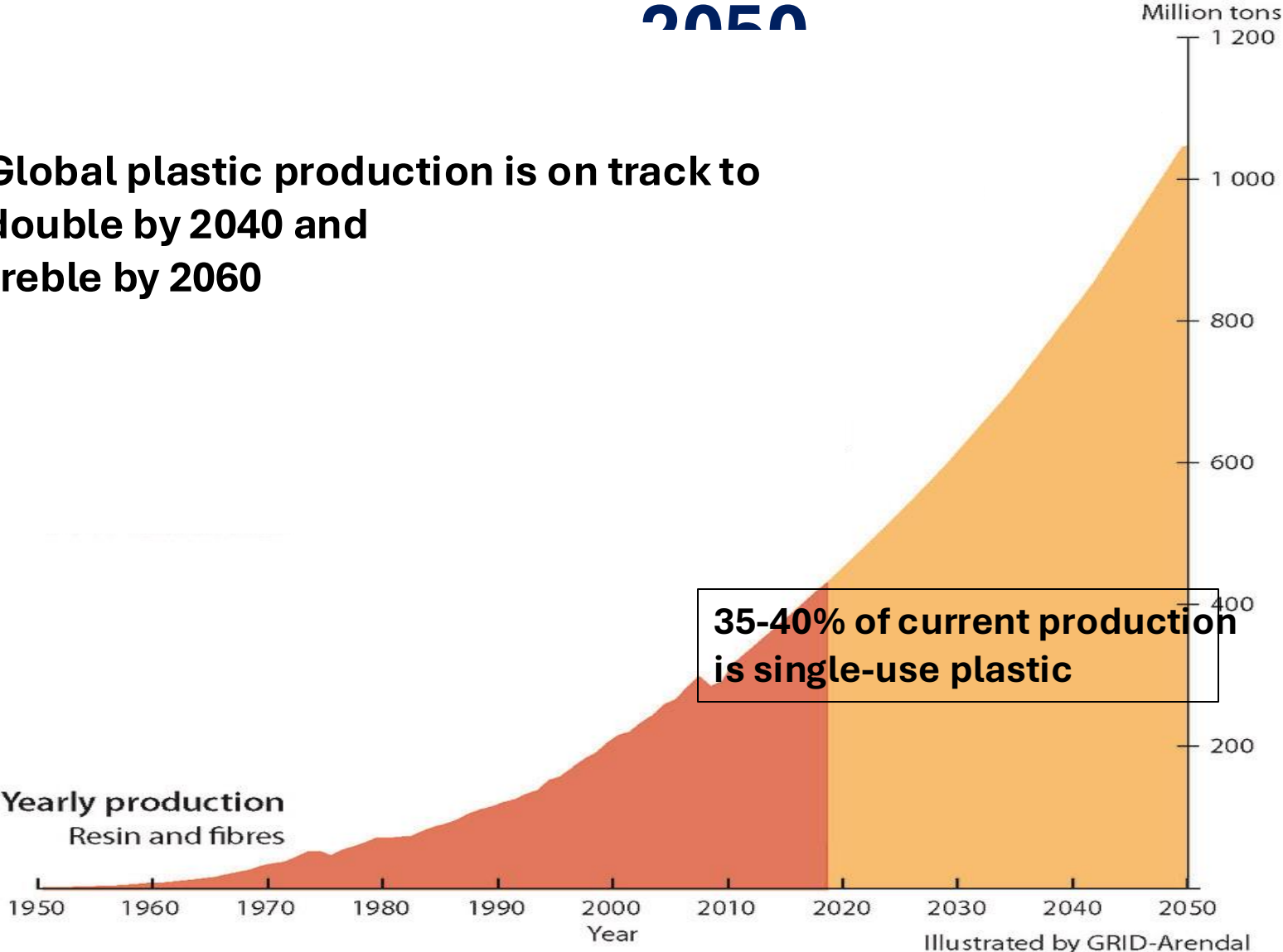
Children are the most vulnerable victims



PROJECTED TRENDS IN PLASTIC PRODUCTION, 2018-

2050

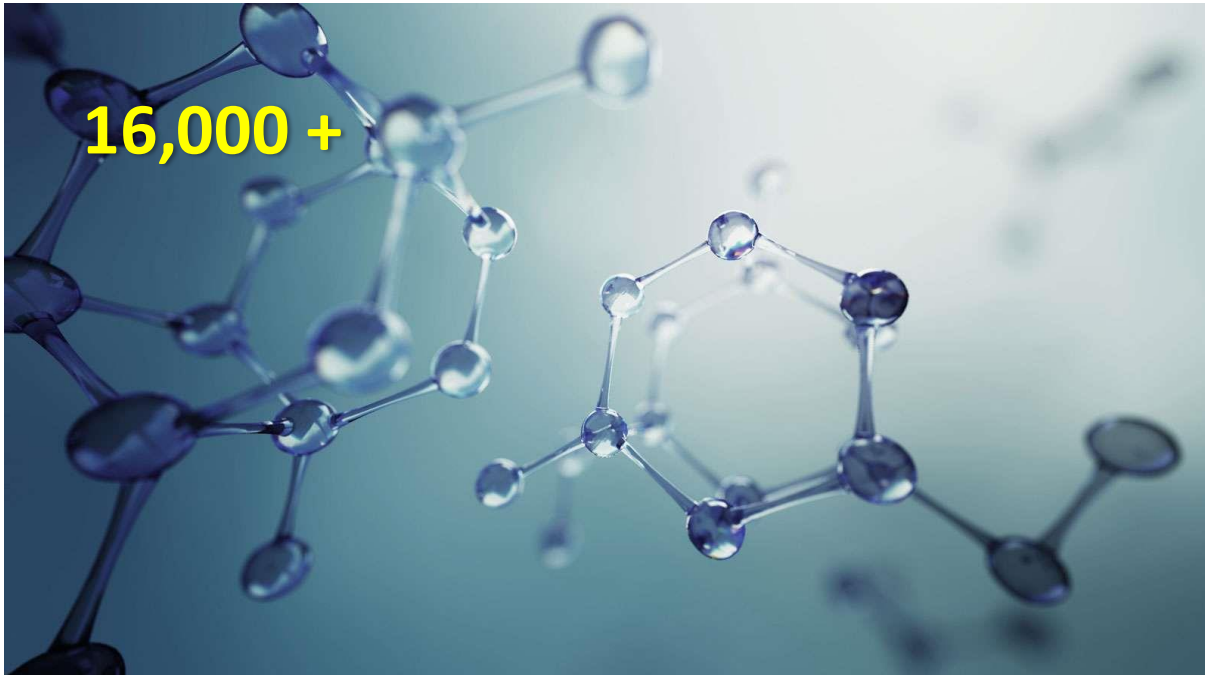
Global plastic production is on track to double by 2040 and treble by 2060



Less than 10% of plastic is recycled

UNEP (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi.

PLASTICS CONTAIN THOUSANDS OF CHEMICALS - MANY ARE TOXIC



These chemicals leach out of plastics to enter people and the environment

They include:

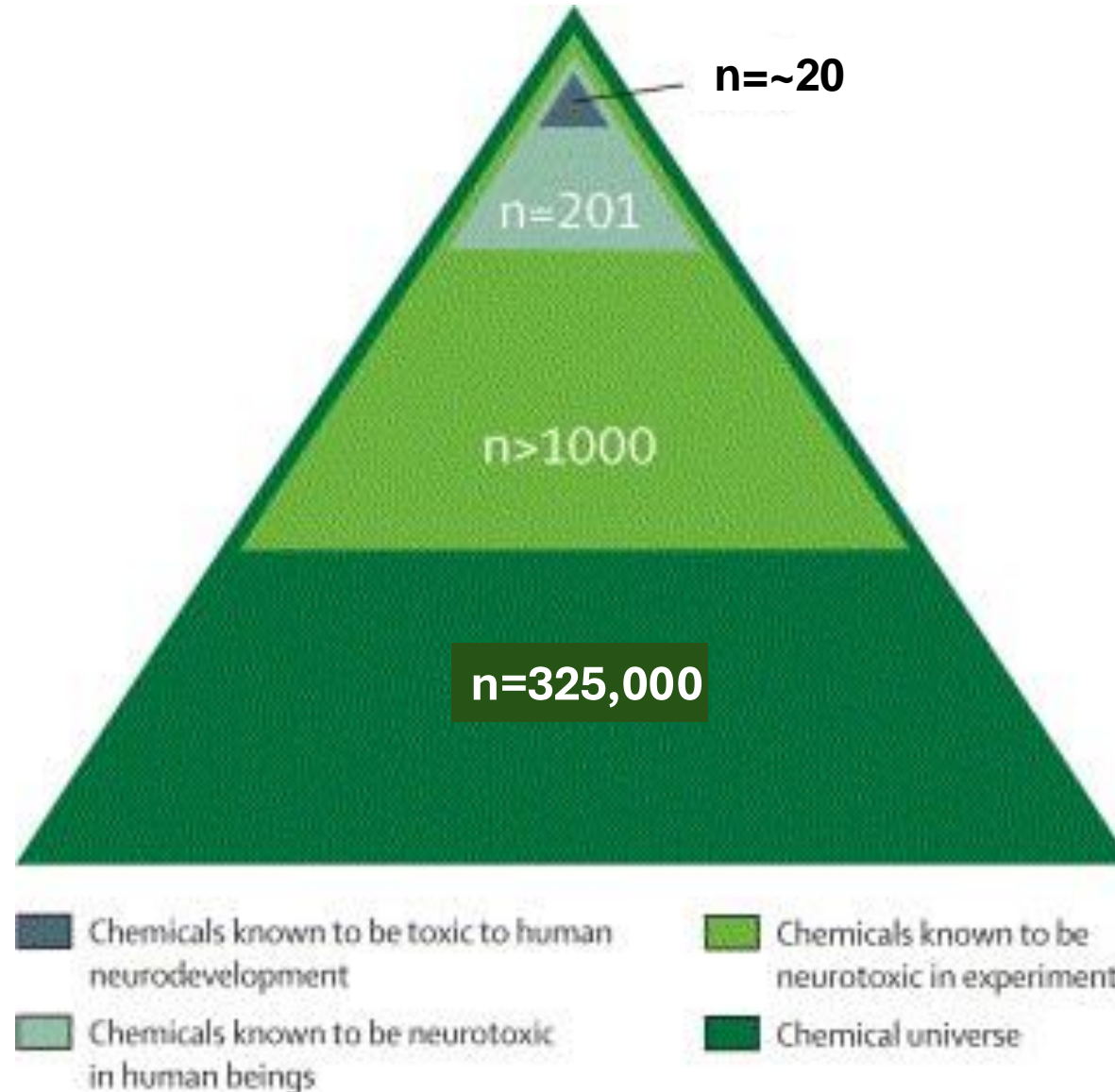
- Carcinogens - vinyl chloride, 1,3-butadiene, PFAS
- Developmental neurotoxicants – brominated flame retardants, organophosphate flame retardants, lead
- Endocrine-disruptors – phthalates, BPA
- Thousands more that have never been tested for toxicity and whose possible hazards are not known

CHEMICALS IN PLASTIC ARE LINKED TO MULTIPLE DISEASES

- Benzene and 1,3-butadiene - leukemia and lymphoma
- PCBs - IQ loss in children
- DDT - female breast cancer
- Phthalates - male reproductive birth defects and decreased fertility
- Phthalates - IQ loss in children
- Bisphenol A (BPA) – altered lipid profile, diabetes, obesity, increased risk for CVD and stroke
- Brominated flame retardants – IQ loss in children
- Organophosphate insecticides – IQ loss and behavioral disorders
- Per- and polyfluoroalkyl substances (PFAS) - immune dysfunction, dyslipidemia, thyroid disorders, cancers

All of these associations were discovered after the responsible chemicals had already been on the market for many years

ARE THERE STILL OTHER CHEMICALS IN PLASTICS WHOSE TOXICITY HAS NOT YET BEEN DISCOVERED?



PLASTIC CAUSES DISEASE, DIABILITY AND DEATH AT EVERY STAGE OF THE PLASTIC LIFE CYCLE



**HEALTH IMPACTS OF PLASTIC
FEEDSTOCK EXTRACTION-
FRACKING**

HEALTH IMPACTS OF PLASTIC MANUFACTURE



HEALTH IMPACTS OF PLASTIC USE



Negative health effects of plastic exposure in early life

Prenatal exposures

Studies have documented these negative health effects



Birth and infancy

- Miscarriage
- Preterm birth
- Decreased birthweight
- Decreased birth length
- Genital structure
- Bronchitis
- Increased BMI



Childhood

- Childhood cancer
- Poorer psychomotor development
- Lower IQ
- ADHD in girls
- Obesity
- Increased BMI
- Asthma
- Allergic rhinitis
- Atopic dermatitis



Childhood exposures

Studies have documented these negative health effects



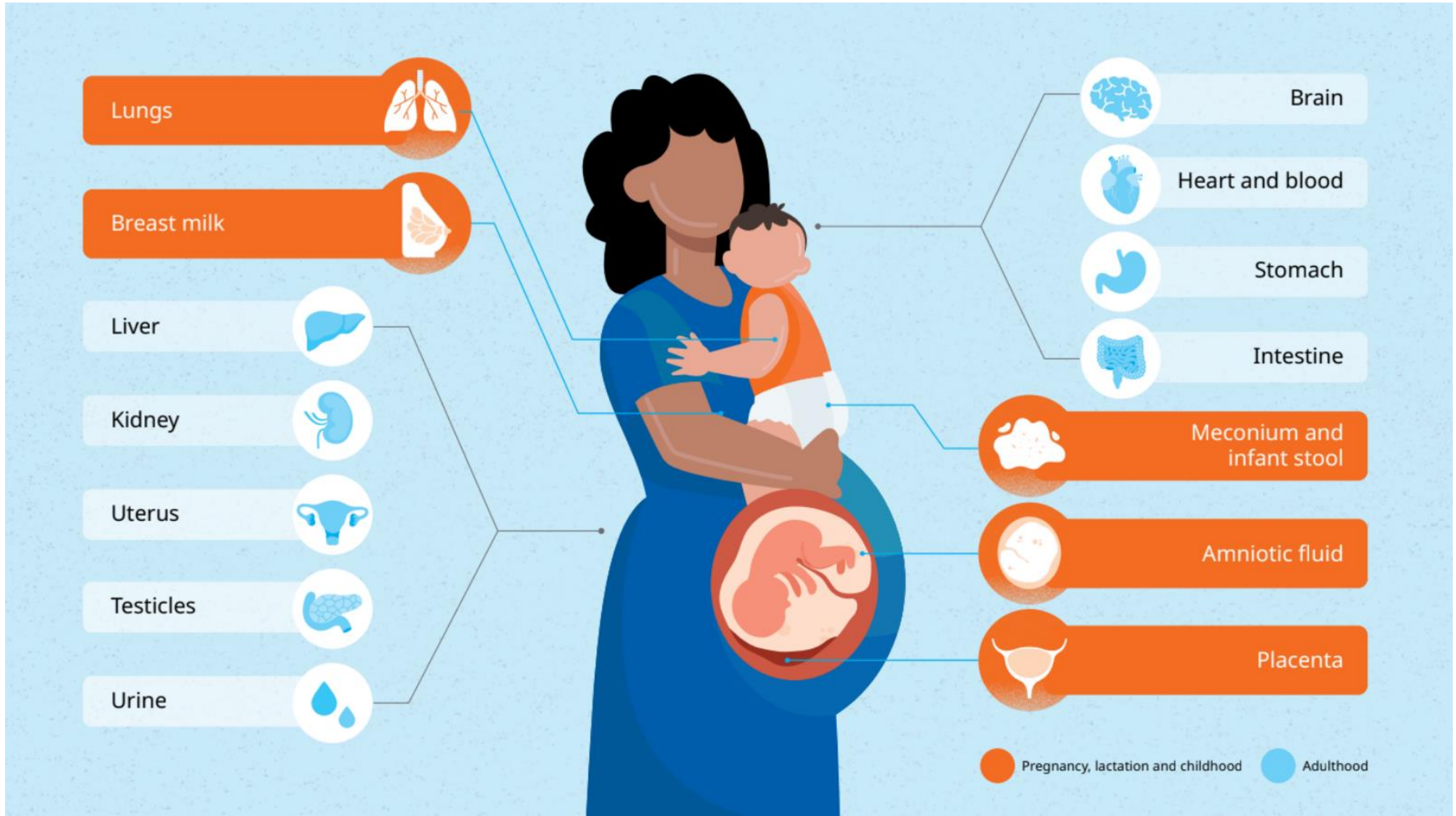
- Lower IQ
- Vector-borne diseases
- Precocious (early) puberty in girls
- Abnormal timing of breast development
- Higher systolic blood pressure
- Obesity
- Allergic rhinitis
- Thyroid function
- Insulin resistance
- Increased waist circumference

INFANTS IN THE WOMB AND YOUNG CHILDREN ARE EXQUISITELY VULNERABLE TO PLASTIC CHEMICALS

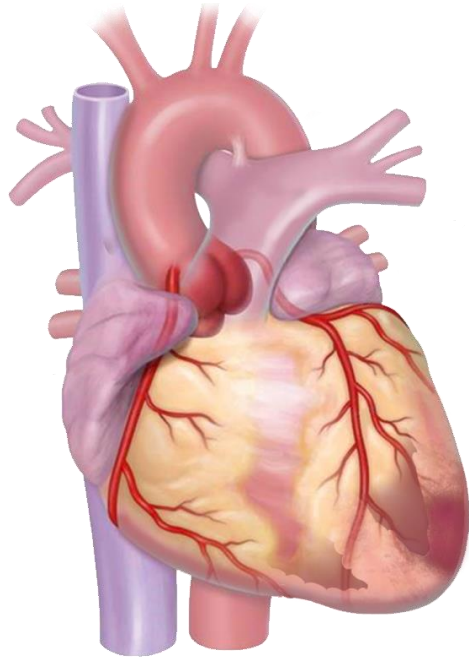


- Toxic chemicals in plastic can cause damage to infants and children at even the lowest levels detectable – levels far below those that harm adults
- Plastic chemicals can cause brain damage, birth defects and cancer.
- The brain damage caused by plastic chemicals can result in autism, ADHD and decreased intelligence (IQ loss)
- There are no safe exposure “thresholds” in prenatal life
- These effects can last lifelong
- **Prevention of exposure is the only truly effective treatment**

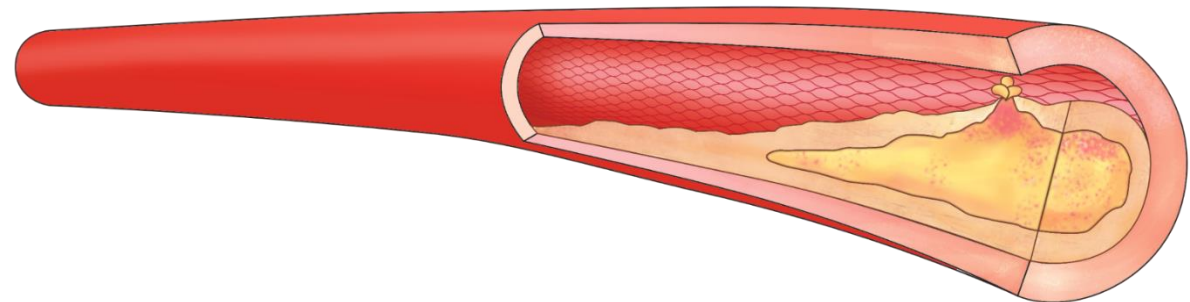
MICRO AND NANOPLASTICS



CARDIOVASCULAR HAZARDS OF MICROPLASTICS



- *New England Journal of Medicine* – March 7, 2024
- 312 patients who underwent carotid endarterectomy
- Microplastics and nanoplastics (MNPs) were detectable in the excised plaque of 58% of the patients
- Patients with MNPs had a 4.5-fold (450%) increase in risk for nonfatal myocardial infarction, nonfatal stroke, or death over the next 3 years.
- Only one study. Does not prove causation. But a striking finding and very worrisome



THE TIME HAS COME WHEN WE MUST ACT

- There is much about plastic and its hazards that we still do not know, and more research is needed
- But we now know very clearly that plastics' harms to human health and the global environment are extremely serious.
- And we know that in the absence of urgent intervention these harms will get much worse.
- We cannot use lack of complete knowledge about plastics' harms as an excuse for inaction.
- We need to cap global plastic production
- We need to address the thousands of chemicals in plastics

THANK YOU!



We are the stewards of this Earth. We hold it in trust for our children .

Generation Plastic



Abheet Solomon

Senior Adviser, Environment

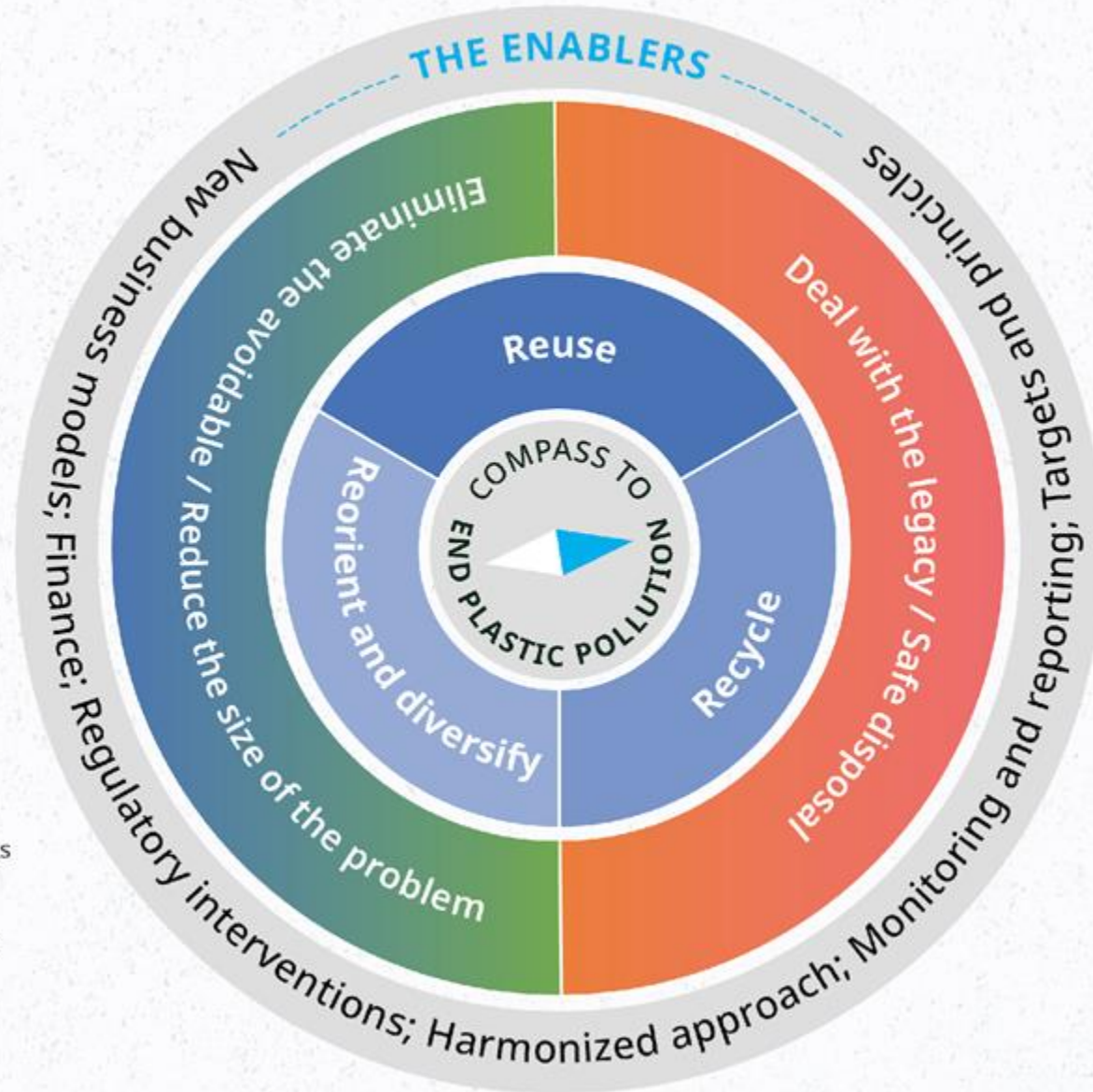
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The compass to end plastic pollution



- Accelerate the market for reusable products
- Accelerate the market for plastics recycling
- Reorient and diversify the market for sustainable and safe plastic alternatives

Recommendations

Generation Plastic calls for integrated, systemic shifts to protect children:

- 1. Addressing the plastic pollution crisis through systems change:** reducing the most problematic and unnecessary plastic uses; transforming the market towards circularity through accelerating the shifts towards Reuse, Recycle, and Reorient and Diversify; and dealing with the legacy of plastic pollution.
- 2. Advancing chemical transparency and product safety for children:** Transparency in chemicals in products can empower consumers, simplify recycling processes, and promote circularity. Products that are marketed towards children should be prioritized according to the precautionary principle. Awareness-raising in communities and schools can empower children and youth. Finally, research on the lifelong health impacts of widespread exposure of children to plastic chemicals and particles should be a high priority.
- 3. Concerted action for children bearing the greatest burden.** Every child has the right to a “clean, healthy, and sustainable environment” (A/RES/76/300). The rights and livelihoods of child waste pickers and fenceline communities must be respected, protected and fulfilled. Underlying structural causes need to be prioritized together with better waste management systems. Children and families living in the communities most strongly impacted by plastics production and waste deserve environmental justice.



<https://ceh.unicef.org/spotlight-risk/plastics>



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