

Clean, safe and secure environments to support early childhood development



Why is the environment important for early childhood development?

Clean, safe and secure environments contribute to enabling environments for nurturing care. Clean air, safe and secure surroundings, and outlets for physical activity are essential conditions for children to survive and thrive. An infant or young child who is exposed to environmental pollutants from sources such as unsafe drinking water, air pollution or chemicals, as well as a child who lacks access to spaces for outdoor physical activity and exploration is at higher risk of both noncommunicable diseases (NCDs) as well as infectious diseases (such as pneumonia and diarrhoea) and developmental delays that can reduce their lifelong cognitive, socio-emotional and physical potential.

This brief summarizes some of the most important environmental health risks faced by children today and it explains why infants and young children are particularly vulnerable. It elaborates on the components of Nurturing Care, especially good health and security and safety. It aims to alert policymakers and practitioners, whether involved with childcare or environmental issues, about the importance of considering early childhood needs in policies and practices, to create environments in which young children can thrive. Examples of practical actions are provided for key settings that affect children's early development - healthcare, home, and childcare settings; and the broader urban and community settings that create both risks and opportunities for children's development.

What is nurturing care?

To reach their full potential, children need the five inter-related and indivisible components of nurturing care: good health, adequate nutrition, safety and security, responsive caregiving and opportunities for early learning. This begins in pregnancy and continues throughout the life course.

We have made great strides in improving child survival, but we also need to create the conditions to help children thrive as they grow and develop. Nurturing care protects children from the worst effects of adversity and produces lifelong and intergenerational benefits for health, productivity and social cohesion.

Nurturing care happens when we maximize every interaction with a child. Every moment, small or big, structured or unstructured, is an opportunity to ensure children are healthy, receive nutritious food, are safe, and learning about themselves, others and their world. What we do matters but how we do it matters more.



NURTURING CARE
FOR EARLY CHILDHOOD DEVELOPMENT

Environmental health and early childhood – the linkages

WHO estimates that about one quarter of deaths of children under 5 could be prevented through healthier environments that reduce key risks including: air pollution, unsafe drinking water, sanitation, and inadequate hygiene as well as exposures to certain toxic chemicals, such as lead and mercury.

Infants and young children are particularly vulnerable to environmental pollution since their bodies and respiratory airways are much smaller, and their organs and immune systems are still developing. And they have a higher proportion of skin to volume ratio. Relative to their size, young children also ingest more food and drink more water. Behaviours typical of infants and young children – such as putting hands and objects into their mouths to explore their environments – as well as the need to explore and play outdoors – also put young children at particularly high risk of exposure to hazards in unsafe or poorly adapted community environments.

Air pollution, for example. Infants and young children breathe more air than adults. A typical adult takes between 12 and 18 breaths a minute, while a 3-year old child takes 20 to 30 breaths a minute and a newborn baby takes 30 to 40 breaths.

On busy streets, infants in strollers and young children are most directly exposed to vehicle tailpipes. Air pollution reduces lung function, increases risk of common respiratory infections and asthma, and can cause childhood cancers and even obesity, due to adverse metabolic changes. It is an important cause of preventable child mortality and there is evidence that both prenatal and postnatal exposure to air pollution can negatively influence neuro development.^{1,2} Finally, air pollution contributes to climate change, which is expected to increase food insecurity, undernutrition, water- and vector-borne diseases, affecting children in particular.

Harmful exposures to environmental pollutants start as early as in utero, as a pregnant mother exposes her developing foetus to the toxicants to which she, herself is exposed, via the air, water, foods or her own skin contact with harmful chemicals.

Clean and safe indoor and outdoor environments optimize a child's early development opportunities, by reducing the exposure to contaminants and by enabling social interaction and physical activity, whether it is in play and exploration, or simply accompanying a caregiver on foot to the local grocery. Such activity is key to reducing obesity risks for infants as well as young children, as well as developing motor, socio-emotional and cognitive skills.³

Advancing healthier environments thus represent a major opportunity for improving children's health, development and wellbeing – and is essential for achieving [Sustainable Development Goal 3, Good Health and Wellbeing](#). It is also part of commitments made under other SDG goals and targets such as Clean Water and Sanitation (SDG 6), Sustainable Energy (SDG 7), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production [including sound chemicals and waste management] (SDG 12) and Climate Action (SDG 13).



What are the nurturing care components?



Good health

Refers to the health and well-being of the children and their caregivers. Why both? We know that the physical and mental health of caregivers can affect their ability to care for the child.



Adequate nutrition

Refers to maternal and child nutrition. Why both? We know that the nutritional status of the mother during pregnancy affects her health and well-being and that of her unborn child. After birth, the mother's nutritional status affects her ability to breastfeed and provide adequate care.

Remember

Clean, safe and secure environments create the conditions for children to develop to their full potential.

Air pollution is estimated to cause 543 000 child deaths annually due to acute lower respiratory infections before the age of 5.¹ This includes emissions from polluting household stoves and fuels at home to emissions from traffic, dust, waste burning, power generation and other outdoor (ambient) sources. Similarly, exposures to chemicals, heavy metals and other toxicants through air, water, food or skin contact are particularly harmful for infants and young children and can lead to lifelong disorders as well as reducing their potential to develop mentally and physically. Individual contaminants often have multiple impacts on health.

Lead exposures, for example can reduce children's IQ, as well as cause learning disability, antisocial behaviour and increased risk of cardiovascular disease in adulthood. One important source of exposure is through ingesting or inhaling particles of paint.⁴ Methylmercury exposures, often through dietary sources, adversely affect neonatal brain and nervous system development, including cognition, memory, attention, language, fine motor and visual spatial skills, and can occur in-utero as well.

Persistent organic pollutants (POPs) are another cause of neuro-developmental delays and exposure occurs through direct contact with pesticides, or indirectly, through air pollution or even ingested through pathways such as mother's breast milk contaminated with pesticide residues.⁵⁻⁶

Key SDG indicators relevant to environmental health*

- Mortality rate [0-5] attributable to household and ambient air pollution (SDG 3.9.1)
- Mortality rate [0-5]-attributed to unsafe water, unsafe sanitation and lack of hygiene (3.9.2)
- Mortality rate [0-5] attributable to unintentional poisoning (SDG 3.9.3);
- % of [0-5] population exposed to annual mean levels of PM 2.5 above 10 µg/m³ (SDG 11.6.2)
- % of urban population living in slums, informal settlements or inadequate housing (SDG 11.1.1)
- % of population that has convenient access to public transport [with special attention to women/children**]. (SDG 11.2.1)
- Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated [11.6.1]
- Average share of the built-up area of cities that is open space for public use [accessible to women and children**] (SDG 11.7.1)

* For SDG indicators with age stratification, [0-5] is noted for purposes of this brief as the relevant age group.

** Target refers to "women/children"



Safety and security

Refers to safe and secure environments for children and their families. Includes physical dangers, emotional stress, environmental risks (e.g., pollution), and access to food and water.



Opportunities for early learning

Refers to any opportunity for the infant or child to interact with a person, place, or object in their environment. Recognizes that every interaction (positive or negative, or absence of an interaction) is contributing to the child's brain development and laying the foundation for later learning.



Responsive caregiving

Refers to the ability of the caregiver to notice, understand, and respond to their child's signals in a timely and appropriate manner. Considered the foundational component because responsive caregivers are better able to support the other four components.

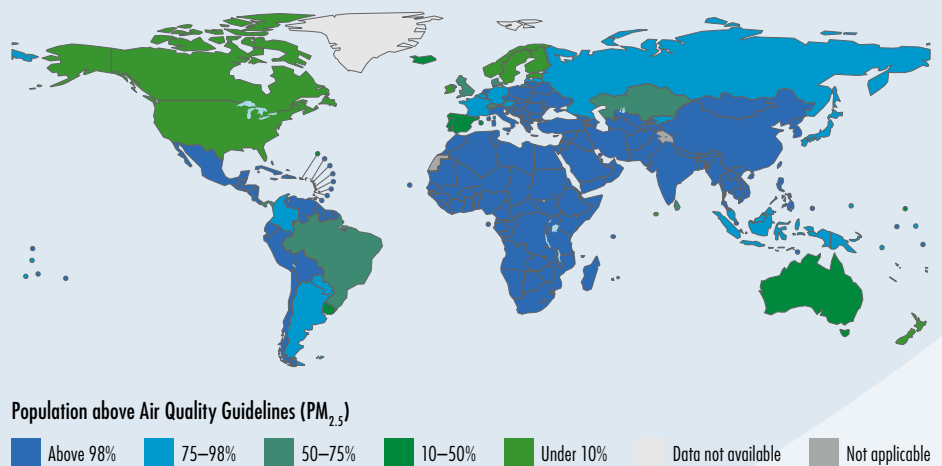
Strengthen

Many countries are already working to protect, promote, and support healthier environments through national standards, policies and regulatory actions, in line with WHO guidelines, international conventions and the WHO Global Strategy on Health, Environment and Climate Change.⁷ Greater awareness of the risks of environmental hazards to children's cognitive and physical development can support more assertive action. Here are a few examples of how we can strengthen our actions.

Government leadership and policies at national level:

- Adopt WHO Air Quality Guidelines.**
 Worldwide 9 out of 10 children under the age of 5 breathe unsafe air, exceeding WHO recommended limits for the most harmful Particle Matter pollutants (PM_{2.5}),⁸ and millions of infants and young children are growing up in areas where average pollution levels exceed WHO guidelines several times over. National policies that include clean household energy solutions, reduce diesel fuel sulphur content, shift to renewable energy and electric vehicles, and enforce strict limits on tailpipe and smokestack emissions from vehicles, factories, waste and agricultural burning, will help achieve WHO Air Quality Guidelines. The same measures reduce emissions of CO₂ and short-lived climate pollutants like black carbon, methane and ozone, slowing the pace of climate change.
- Integrate WHO Housing and Health guidelines into national building codes,** including WHO guidelines for Household Fuel Combustion and reinforce national standards for safe Water, Sanitation and Hygiene (WASH). Household air pollution exposures from the burning of wood, coal, kerosene and charcoal, dung and crop waste in inefficient stoves is responsible for a significant proportion of child deaths from pneumonia in low- and middle-income countries. Kerosene is a major risk factor for burns and accidental poisonings. In addition, household air pollution exposures during pregnancy increases risk of stunting and may affect brain development. Lack of household access to safe water, sanitation and hygiene remains a significant factor in under-5 deaths from diarrhoeal disease.

Fig. 1 Proportions of children under 5 years living in areas in which the WHO air quality guidelines (PM_{2.5}) are exceeded, by country, 2016.

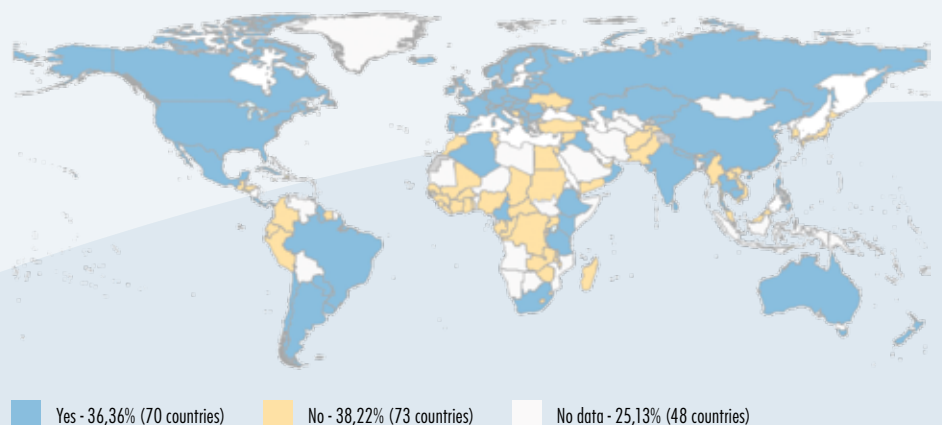


Source: Air pollution and child health: prescribing clean air. Summary. Geneva: World Health Organization; 2018.

- Ban lead in paint and adopt and enforce safe management of chemicals, based on international chemicals conventions and SDG 12.**^{9-10,11} Lead exposure reduces IQ, accounting for 63.8% of the global burden of developmental intellectual disability that is not attributable to biological factors. Lead is still present in paint, toys,

cosmetics, jewellery, batteries, electronic waste and traditional medicines. Common mercury exposure pathways for pregnant women and children include discarded waste, artisanal mining, or consumption of fish and shellfish containing mercury residues emitted by sources such as coal power plants.

Fig. 2 WHO member states with legally-binding controls on lead paint, as of 30 September 2018.



Data source: World Health Organization/ United Nations Environment Programme.

Add

- **Enact or enforce robust legislation for solid waste management, restricting e-waste imports and prohibiting child labour in waste management and mining.**

Electronic and electrical waste, is the fastest growing solid waste stream in the world. When improperly recycled, often through home-based enterprises, it exposes children to toxicants which can lead to permanent lung damage and cancer, as well as reduced intelligence and attention deficits. In terms of mining, the ILO estimates that nearly one million children between 5-7 years of age are engaged in small-scale mining and quarrying activities, putting them at risk of direct exposures to toxic chemicals, including mercury (in the case of gold).

- **Incorporate criteria for child- and parent-friendly designs in national land-use plans and investments with reference to the [WHO Global Action Plan on Physical Activity](#).**

Planning walkable cities and neighbourhoods, with services and schools accessible on foot or by public transport, and safe public and green spaces for movement, play and exploration, needs to start with national policies and investments in urban land use, housing and transport. Greener and more walkable cities also keep cities cooler during heat waves, and reduce urban air pollution as well as the carbon footprint, creating multiple synergies between health and climate resilience.¹²⁻¹³

The health sector, urban leaders, and local communities can work together to a) assess risks using health-based tools b) prescribe solution using health-based guidance and c) implement policies that promote clean, safe, and secure environments for children, in the context of healthy, sustainable cities, communities and health services. The same strategies reduce climate emissions, making communities and health care services more resilient to climate change. Below are indicative examples of areas where health, urban and community leaders can take action.

Primary health care providers

Health care providers can build their own awareness about environmental health risks and solutions; so as to integrate environmental health themes directly into primary healthcare services, and particularly delivery of maternal and child health programmes, visits, and outreach.

Below are just a few indicative examples of actions and issues that can be prioritized at primary health care level:

- **Clinical training for health care providers.** Doctors, nurses and health-workers need to be trained to act more effectively. WHO's [Children's Environmental Health training package](#) for health care providers covers some two dozen core areas of environment health risk, exposure pathways, assessment methods and solutions. Another tool, the [paediatric environmental health history record](#), can help clinicians assess a patient's risks and solutions in clinical visits. Health systems may also consider the creation of [Children's Environmental Health Units](#).
- **Safe water, sanitation, hygiene and healthcare waste management (WASH) in health facilities** to ensure quality and safety of health care services.

Currently one in 4 healthcare facilities lack basic water and one in five lack basic sanitation services worldwide. Local health services can raise awareness about needs and gaps to local government leaders and district health authorities.

- **Maternal, newborn and child health services.** Since children are among the most vulnerable groups to environmental risks, incorporating environmental health themes in maternal, newborn and child health (MCH) services can expand the awareness of pregnant women, mothers, partners and families about key risks and solutions.
- **Household-based environmental risk assessment.** In the course of routine maternal, newborn and child health programmes, health workers can support assessment of household health and safety risks and promote awareness about the importance of safe and clean home environments and solutions, such as clean cookstoves and elimination of lead paint.
- **Childcare and other early childhood institutions.** Ensure that environmental risks are addressed in health and safety codes for childcare and other early childhood settings (e.g., nurseries, preschools), including for: radon, asbestos, lead in paint and soils, formaldehyde in building materials, as well as for WASH facilities, safe green/open space provision, responsible waste management and recycling.



Local government

Rapid urbanization calls for urban leaders to use their mandate to develop more child-friendly cities – which are greener, more sustainable and more vibrant places for people of all ages to live, work and visit. Selected examples of strategies and tools, include:

- **Urban health impact assessment.** Assess air pollution impacts from traffic, household energy and other sources, and recommend health-optimized emission-reduction strategies for traffic, waste management and household energy, as well as green space expansion, using WHO [Health Impact Assessment](#) methods and tools such as [WHO AirQ+](#), [CHEST](#), [Sustainable Transport and Health tools](#), and others.
- **Child-friendly urban planning.** Based on health assessment of key risks and opportunities, urban leaders can design more walkable communities, based around neighbourhoods of [homes](#), [schools](#), [fresh food stores](#) and [services linked by safe pedestrian networks and public transport](#). This supports active outdoors movement and exploration by young children with caregivers during daily routines. [Key principles of child-friendly cities include:](#) promoting safe, healthy environments, where crucial services are proximal, and where responsive interactions with loving adults are possible.¹⁴ Green spaces, including shade, water and community cultivation of healthy, fresh foods provide children with diverse outdoor experiences, points of early childhood social interaction, as well as shielding cities from heat island impacts – whereby urban temperatures are much warmer than surrounding areas in heat waves.

- **Healthy housing.** Local governments can play a leading role in enforcing local housing code provisions for healthy housing as per [WHO Housing and Health guidelines](#), with clean energy;

access to safe drinking water/ sanitation and structures free of mould, wet, damp as well as toxic materials such as asbestos and lead.

- **Safe routes for children's active transport to school and other activities.** Develop suitable pedestrian and bike routes that children can use. This includes continuous sidewalks and bike trails, safe crossings, and school crossing guards, in line with global best practice and [WHO Guidance](#).

Communities, families and caregivers

Many community fora exist where a broad spectrum of environmental health needs, risks and solutions can be addressed. These include: community centres, childcare centres, primary and nursery schools, and other early childhood education programmes, as well as civil society institutions. Community institutions can incubate and support local leadership on priority issues – acting as a vital link between local authorities, the health sector and families and caregivers and forging initiatives aimed at households, schools and community-wide.

Here are some indicative examples of themes that may be prioritized:

- **Safe, healthy home environments.** Build awareness of risks and opportunities into community-based courses and seminars for families and caregivers: covering themes such as home safety risks, safe storage of chemicals, and clean cooking solutions, to ensure that infant and young children can safely their most immediate environment.

- **Safe, healthy community environments.** Initiate and lead programmes on environmental risks that affect young children in the community context, such as responsible recycling, as well as planning of services, [open street initiatives](#), green spaces and corridors that support safe, healthy physical activity and make neighbourhoods more child-friendly.
- **Childcare and other early childhood institutions.** Work with teachers and caregivers to ensure clean drinking water and safe lavatories and latrines on premises; healthy indoor air quality, healthy, nutritious fresh foods; and access to safe, clean, green spaces for outdoor play, wherever feasible, adapted to local environmental conditions, e.g. water-resistant plants and attention to shade in hot, arid countries.
- **Physical activity and play.** Incorporate awareness about the importance of physical activity and access to outdoor play spaces into parental education as well as nursery/childcare and school programmes, with reference to [WHO Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age](#). This should include awareness of children's health risks from physical inactivity, including increased risk of obesity and diabetes.



Creating clean, safe, and secure environments for early childhood - Selected resources

Institutions and networks

Children's Environmental Health - World Health Organization:
<https://www.who.int/health-topics/children's-environmental-health>

Clean Cooking Alliance - UN Foundation:
<https://www.cleancookingalliance.org/home/index.html>

Environment and Climate Change - UNICEF:
<https://www.unicef.org/environment-and-climate-change>

Urban95, Cities for Young Children - Bernard van Leer Foundation:
<https://bernardvanleer.org/solutions/urban95/>

Resources by topic

Air Pollution – Risks, data and guidance, WHO: <https://www.who.int/health-topics/air-pollution>

Air Pollution – Household energy, WHO: <https://www.who.int/airpollution/household/en/>

Artisanal and small-scale mining and health, WHO, 2016:
<https://apps.who.int/iris/bitstream/handle/10665/247195/9789241510271-eng.pdf?sequence=1>

Basel, Rotterdam and Stockholm Chemicals Conventions: <http://www.brsmeas.org/>

Children's environmental health training modules, WHO:
https://www.who.int/ceh/capacity/training_modules/en/

Children's environmental health units, WHO:
<https://www.who.int/publications-detail/children's-environmental-health-units>

Clean household energy solutions (CHEST), WHO:
<https://www.who.int/airpollution/household/chest/en/>

Global Action Plan on Physical Activity, WHO:
<https://www.who.int/ncds/prevention/physical-activity/global-action-plan-2018-2030/en/>

Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age, WHO: <https://apps.who.int/iris/handle/10665/311664>

Healthier Environments for healthier populations: Why do they matter and what can we do? WHO, 2019: <https://www.who.int/sustainable-development/urban/guidance-tools/en/>

Housing and Health Guidelines, WHO:
<https://www.who.int/sustainable-development/publications/housing-health-guidelines/en/>

Inheriting a sustainable world: Atlas on children's health and the environment. WHO, 2017.
<https://www.who.int/ceh/publications/inheriting-a-sustainable-world/en/>

Minamata Convention on Mercury: <http://www.mercuryconvention.org/>

Nutrient requirements and dietary guidelines, including guidance on healthy diets, trans-fats and sugars intake for adults and children, WHO: <https://www.who.int/nutrition/publications/nutrient/en/>

Open Streets Initiative, 8 80 Cities and Streets Plans: <https://openstreetsproject.org/>

Paediatric environmental history record, WHO: <https://www.who.int/ceh/capacity/paedenvhistory/en/>

Physical activity and young people, WHO:
https://www.who.int/dietphysicalactivity/factsheet_young_people/en/

Preventing disease through healthy environments: a global assessment of the burden of disease from environmental risks, WHO, 2016:
https://www.who.int/quantifying_ehimpacts/publications/preventing-disease/en/

Reducing global health risks through mitigation of short-lived climate pollutants, WHO/Climate and Clean Air Coalition, 2015: <https://www.who.int/phe/publications/climate-reducing-health-risks/en/>

Urban Health Initiative, WHO: <https://www.who.int/sustainable-development/cities/en/>

Urban health and sustainable development, guidance and tools, WHO:
<https://www.who.int/sustainable-development/urban/guidance-tools/en/>

Urban95 – Design of safe, healthy urban environments for early childhood. Bernard Van Leer Foundation:
<https://bernardvanleer.org/solutions/urban95/>

WASH- Water Sanitation and Hygiene, WHO: https://www.who.int/water_sanitation_health/en/

WASH in Health Care Facilities, WHO: https://www.who.int/water_sanitation_health/facilities/healthcare/en/

Did you know?¹⁵

- ✓ The human brain develops faster from pregnancy to age three than at any other time.
- ✓ Over 80% of a human brain is formed by the age of three years.
- ✓ The care and support provided to children in the earliest years by parents and caregivers is critical for healthy brain development.
- ✓ In the first years of life, parents, intimate family members and caregivers are the closest to the young child and thus the best providers of Nurturing Care. In order to provide caregivers with time and resources to provide nurturing care, policies, services and community supports need to be in place.
- ✓ Nurturing care increases health, productivity and social cohesion throughout a lifetime, and the benefits continue into the next generation.
- ✓ 250 million children under the age of five in low- and middle-income countries – more than four out of every ten children – are at greater risk of not reaching their development potential due to poverty and neglect.
- ✓ Research shows that for every US\$1 spent on early childhood development interventions, the return on investment can be as high as US\$13.
- ✓ Nurturing, protecting and supporting caregivers and children is essential to achieve the Sustainable Development Goals.



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8. *Air Quality Guidelines, global update 2005*. Geneva, World Health Organization, 2006. https://www.who.int/phe/health_topics/outdoorair/outdoorair_aqq/en/
9. The Minamata Convention on Mercury. <http://www.mercuryconvention.org/>
10. SDG Target 12.4 <https://sustainabledevelopment.un.org/sdg12>; [Note: The SDG target calls for countries "achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment," with reference to Basel, Rotterdam, and Stockholm chemicals conventions]. Basel, Rotterdam and Stockholm Chemicals Conventions. <http://www.brsmeas.org/>
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Nurturing care framework for early childhood development

The Nurturing care framework for early childhood development: A framework for helping children SURVIVE and THRIVE to TRANSFORM health and human potential builds upon state-of-the art evidence of how child development unfolds and of the effective policies and interventions that can improve early childhood development. The Framework was developed by WHO, UNICEF, and the World Bank Group, in collaboration with the Partnership for Maternal, Newborn and Child Health the Early Childhood Development Action Network and many other partners to provide a roadmap for ensuring attainment of the Sustainable Development Goals and survive, thrive and transform goals of the Global Strategy on Women's, Children's and Adolescents' Health. Launched alongside the 71st World Health Assembly in May 2018, it outlines: i) why efforts to improve health and wellbeing must begin in the earliest years, from pregnancy to age 3; ii) the major threats to early childhood development; iii) how nurturing care protects young children from the worst effects of adversity and promotes physical, emotional and cognitive development; and iv) what families and caregivers need to provide nurturing care for young children.

For more information:
<https://nurturing-care.org>
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#NurturingCare

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