Working towards cleaner air for children in Mongolia

unicef
for every child

A case study on the cooking, heating and insulation products (CHIP)

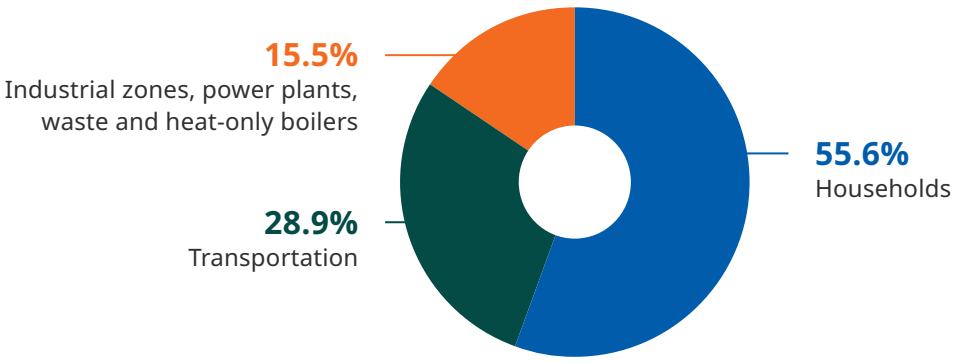
Progress and lessons learned between 2012 and 2025

Context

Every child has the right to breathe clean air. Yet, in many parts of the world, children are deprived of this most basic of human rights. According to the 2025 State of Global Air report,[i] approximately 676,000 children under the age of five died as a result of air pollution in 2023. Air pollution is the greatest environmental risk to children's health globally. Children living in low- and middle-income countries face the greatest health burden from air pollution.

Long-term exposure to $PM_{2.5}$ – fine airborne particles measuring less than 2.5 micrometres in diameter – is the most consistent and accurate predictor of poor health outcomes across populations. These particles are emitted from residential fuel use, coal burning power plants, vehicles, agricultural and industrial activities, waste burning, wildfires and numerous other human and natural sources.

Sources of air pollution in Mongolia



Source: Ministry of Environment and Climate Change

Across Mongolia, 60 per cent of the urban population live in traditional dwellings called gers. The primary driver of the country's air pollution, especially in the capital Ulaanbaatar and other urban areas, is the combustion of raw coal in traditional stoves within ger districts (55.6 per cent), particularly during the cold season. With fuel costs accounting for up to 40 per cent of poorer household's income during winter months, families are forced to use the cheapest and most readily available fuels, which are often the most polluting. Other drivers of air pollution are transportation (28.9 per cent), and industrial zones, power plants, waste and heat only boilers (15.5 per cent).[ii]

Approximately half of Mongolia's 3.5 million population live in Ulaanbaatar. It is recorded as the coldest city in the world, and largely as a result of this, one of the most polluted cities in the world, especially during the coldest months when temperatures can plummet to minus 40°C. It is the unique combination of geography, climate, rapid urbanization, and socio-economic factors that have culminated in the air pollution crisis in Ulaanbaatar. Situated in a valley surrounded by mountains, Ulaanbaatar is highly susceptible to temperature inversions, which trap cold, polluted air close to the ground, preventing its dispersal.

According to the 2025 World Health Organization's (WHO) Air Quality Standards database, $PM_{2.5}$ for an average 24-hour period in Mongolia was 50 micrograms per cubic metre (ug/m^3)[iii] – more than three times the WHO air quality guidance for $PM_{2.5}$ (15 ug/m^3) considered safe for public health. During the long harsh winter months, $PM_{2.5}$ concentrations are often double the annual average and extreme hourly peaks in $PM_{2.5}$ are often masked by daily and annual averages. Typical winter concentrations in urban environments are characterized by variable highly elevated $PM_{2.5}$ concentrations averaging around 80–90 ug/m^3,[iv] with peak concentrations during the coldest days of the year exceeding 650 ug/m^3.[v]

In Mongolia, air pollution has become a public health crisis, especially for children. Evidence has shown that pregnant women and children exposed to air pollution in Ulaanbaatar face a greatly increased risk of a wide range of harmful health consequences,[vi] including adverse birth outcomes, premature death, infant mortality, and problems with lung function, neurodevelopment, and elevated rates of respiratory illness in children. Household air pollution has been identified as the main risk factor to children's health and pneumonia has become the second leading cause of mortality in children under 5.[vii]

The National Statistics Office of Mongolia estimates that over 800,000 children (or 63 per cent) in Mongolia are exposed to ambient air pollution above 35 $\mu g/m^3$.[i] Urban children have on average 40 per cent lower lung function than their rural counterparts which contributes to higher absenteeism rates among preschool and middle school students.

Summary of UNICEF's cooking, heating and insulation products

This case study documents UNICEF's primary intervention to reduce air pollution exposure for children and pregnant women – the cooking, heating and insulation products (CHIP) – and highlights the successes and limitations of this initiative in Mongolia. CHIP provides a low-cost solution to meet the cooking, heating and insulation needs of ger households in urban areas.

As of May 2025, CHIP had reached 4,700 households and 25 kindergartens. Performance monitoring demonstrated that CHIP achieved considerable success, by improving thermal comfort, safety, and energy efficiency while reducing indoor smoke from coal stoves. Furthermore, end-users report overwhelmingly positive experiences, citing improvements in convenience, safety (by eliminating the risk of burns), and household cleanliness. The package also saves women and children over 40 minutes of daily labour previously dedicated to tending coal stoves, thereby freeing up time for other economic or educational pursuits.

Intrinsically, CHIP is a powerful tool in reducing household-level exposure to air pollution in gers, as well as contributing to reduced ambient air pollution generally. But alone, CHIP cannot address the harmful impacts of air pollution affecting child health in Mongolia, especially from ambient sources. Technical evaluations have highlighted that the successful CHIP outcomes - in eliminating the primary internal source of pollution in gers and thereby improving indoor air quality – are countered by the severe ambient air pollution in ger districts which infiltrates dwellings, preventing indoor air quality from reaching safe levels. Other significant barriers

Without any masks, Ariunsaikhan walks her three children to school and kindergarten while the chilly morning sky is loaded with $PM_{2.5}$. It's minus 19°C outside and the $PM_{2.5}$ μg/m³ level is over 400.

"I'm very worried about the air pollution in this district," says Ariunsaikhan, a single mother of 29 years of age. Her three year-old son, Tuvshinsaikhan, was born with birth defects. "The doctor said it might be related to the air I was breathing when I was pregnant. I also know many women who have had miscarriages or have given birth too early." Ariunsaikhan and her three children live in a ger. "In wintertime, the kids are always coughing. I give them traditional remedies and hot soups."

– Ariunsaikhan explains as she bundles up her children for the 40-minute walk to school.

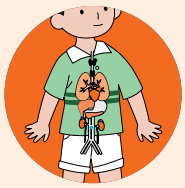
preventing CHIP from achieving its goal of improved household air quality and therefore healthy children, include its relative high cost for low-income households and the prerequisite of a robust and accessible electrical grid across Mongolia.

We can only expect to see a significant improvement in child health indicators linked to air pollution when CHIP is taken to scale. Currently, CHIP only meets 3 per cent of what is needed to improve ambient air quality in Mongolia to bring about these improvements in child health. UNICEF estimates that at least 144,000 households would need to switch to the CHIP package – a scale-up to reach a critical mass of usage to alter ambient air quality. To enable this successful outcome in tackling the air pollution crisis and improving child health in Mongolia, the Government must adopt a holistic and robust approach based on clean air solutions.

Children are not little adults

Children's unique physiological characteristics, combined with their behaviours and environments, make them particularly vulnerable to both indoor and outdoor air pollution.

Young children breathe more rapidly and breathe in more air relative to their body weight



Physiologically, children are more vulnerable because their brain, lungs and other organs are still developing

Children's behaviours, like crawling and playing on the ground, increase their exposure to dust and other pollutants

Children spend a substantial amount of time indoors and are therefore more exposed to household air pollution

But, children also spend more time than adults outside and therefore have more exposure to outdoor air pollution[ix]

Air pollution threatens the health of children globally

The journey towards clean air in Mongolia

Government interventions

International partners' interventions

2012

World Bank – 'Ulaanbaatar Clean Air Project' and additional financing for technology pilots, 2012–2023

2014

Climate and Clean Air Coalition – Mongolia joined the Coalition

2015

State Policy on Energy – long-term development strategy vision 2015–2030

2017

National Programme for Reducing Air and Environmental Pollution, 2017–2025

BreatheLife campaign commitment to WHO-led global initiative

2018

National Centre for Public Health and UNICEF launched 'Mongolia's Air Pollution Crisis: A call to action to protect children's health'[x]

Asian Development Bank (ADB) – Ulaanbaatar Air Quality Improvement Program[xi] ,2018–2021

UNICEF Mongolia and Swiss Agency for Development and Cooperation (SDC) – 'Reducing the Impact of Air Pollution on Maternal and Child Health' ,2018–2023

2019

Government's Resolution No. 62 banned the use of raw coal for domestic heating in Ulaanbaatar

UNICEF and local government piloted CHIP in Bayankhongor city

European Union (Geres, PIN) SWITCH-Asia (Switch off Air Pollution)

Nationally Determined Contributions to the Paris Agreement 2021–2025 updated

Clean Air Action Plan at provincial and local government level

State green loan for CHIP introduced (8% interest rate loan released by three commercial banks)

2020

National codes on hospital, school and kindergarten building planning and design updated, 2020–2023

UNICEF and provincial government expanded CHIP to Umnugovi and Govi-Altai provinces

2021

Action Plan for Implementation of the National Environmental Health Programme, 2021–2024

UNICEF launched Agaar Neg Platform

Youth for Climate and Clean Air – Teen Parliament initiative started

2022

State green loan for CHIP lowered to 3%

Vision 2050 outlined the long-term development strategy for energy and environmental reforms (ongoing)

2024

Joined the Intergovernmental Declaration 'Children, Youth and Climate Action'

2025

Children's Environmental Health Collaborative[xii] – Government and Ministry of Health joined

Cabinet Resolution on Gas Transition to switch from solid fuel to gas heating for 50,000 households

Municipality of Ulaanbaatar approved over US$500,000 for ger insulation and ventilation in ger districts

Third Nationally Determined Contributions to Paris Agreement 2025–2035

Interventions to improve air quality for children

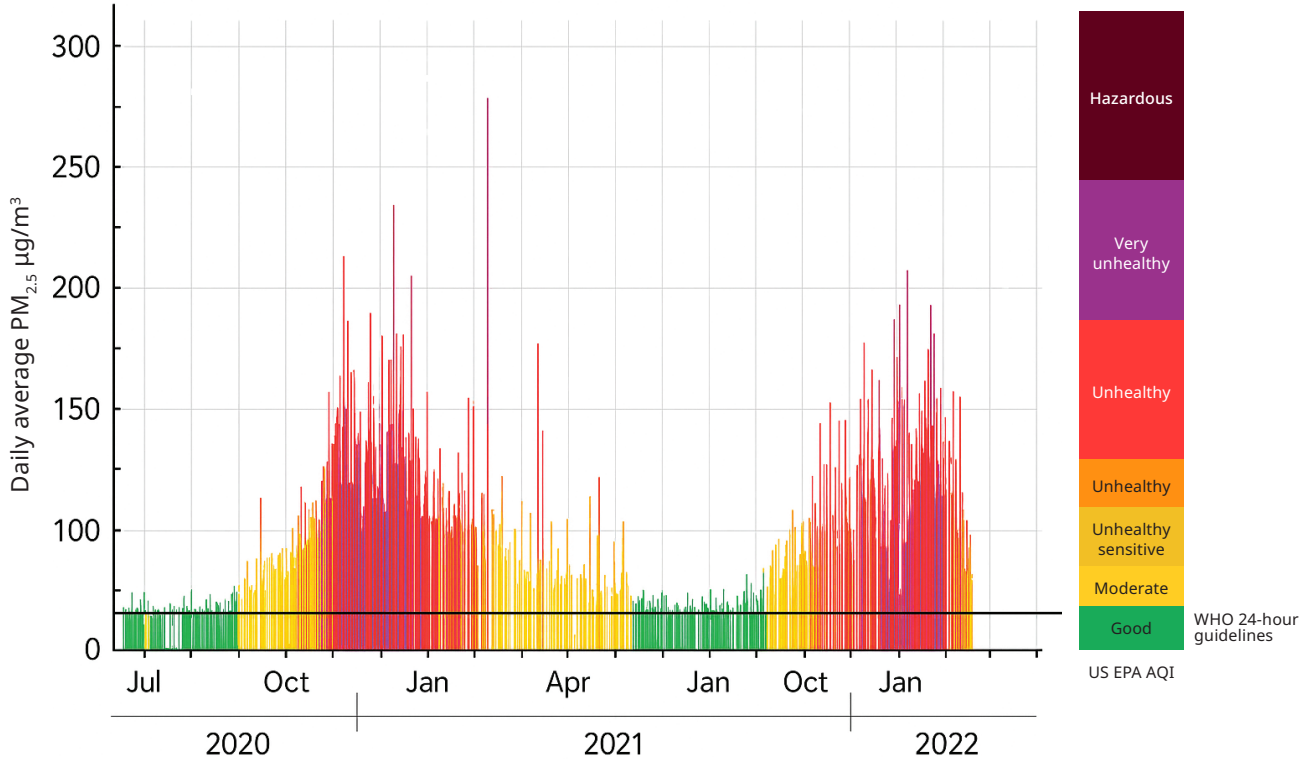
UNICEF's air pollution work in Mongolia builds on the UNICEF Healthy Environments for Healthy Children Framework to ensure clean air for healthy children (see 'UNICEF steps towards clean air for healthy children' on page 63). UNICEF programmes to reduce the impact of air pollution on maternal and child health focus on prevention – reducing exposure to air pollution – and improving children's health by mitigating impact after exposure.

Assessing the situation: generating evidence to drive sustainable change

UNICEF collaborated with a wide range of national and international academic institutions[xiii] to gather evidence through monitoring air quality and its health impacts to: determine UNICEF programmatic interventions; advocate for governmental policy changes; and raise public awareness around air pollution.

Coal-free solution for Mongolian Traditional Yurt: CHIP package

BAM 1020 $PM_{2.5}$ measurements from Bayankhongor, July 2020–January 2022



Source: National Agency for Meteorology and the Environmental Monitoring in Mongolia and UNICEF

In 2020, UNICEF and the National Agency for Meteorology and Environmental Monitoring collaborated with Washington University in St. Louis (U.S.A.) and the Building Energy Efficiency Center of the Mongolian University of Science and Technology to conduct research and collect air pollution measurements. Between 2020-2023, low-cost indoor air quality monitoring sensors were installed in 67 kindergartens and 21 health facilities.

To obtain continuous measurements of $PM_{2.5}$, the BAM 1020 monitor was installed in Bayankhongor Province: training was organized for local experts by UNICEF and the Building Energy Efficiency Center. Data was uploaded to the https://weather.gov.mn/ website.

UNICEF supported the National Centre for Public Health (NCPH) in establishing a surveillance system for environmental health to gather data on indoor and outdoor air pollution. Subsequently, NCPH has enhanced its surveillance, data accessibility and integration through the Environmental Surveillance System (https://tandalt.mn). Geo-spatial mapping has enabled analysis of air pollution and respiratory disease trends by age group and location, which are critical for health planning and targeted interventions.

In 2022, UNICEF supported the Central Laboratory for Environmental Monitoring (CLEM) to conduct the air pollution source apportionment study in Ulaanbaatar. Air quality samples were taken at four sites (near a power station, near a main road/junction, downtown area, and in a ger district) over seven days during the non-heating season and heating season. During the heating season, $PM_{2.5}$ was found to be very high in ger areas.

What did we learn from this research and how was it used?

Key results included:

- On the coldest days, the daily average for $PM_{2.5}$ was recorded at 687 $\mu g/m^3$ – 27 times above WHO recommendations.[xiv]
- In February 2018, extreme pollution spikes in Ulaanbaatar reached 3,320 $\mu g/m^3$ $PM_{2.5}$ at one air pollution monitoring station – 133 times the WHO guideline.[xv]
- A long-term trend shows a decrease of 34.3 $\mu g/m^3$ after the government's 2019 raw coal ban in Ulaanbaatar.
- 16 of 80 indoor air quality samples from schools, kindergartens and hospitals in Ulaanbaatar contained traces of formaldehyde and benzene, which are both carcinogenic to humans.
- A link between air pollution and alarming increases in respiratory diseases.[xvi]
- A link between air pollution and adverse maternal health outcomes including stillbirths, preterm births and lower birth weights.[xvii]

UNICEF used the evidence to develop and map interventions to reduce the impact of air pollution on maternal and child health, and to advocate with governmental decision makers for policy changes and to inform awareness-raising and advocacy with families and communities (see 'Continued work to ensure clean air for children in Mongolia').

Implementing high-impact solutions

The core component of UNICEF's work to reduce children and pregnant women's exposure to air pollution is the cooking, heating and insulation products. The primary goal of the project was improved indoor air quality for households in ger districts.

In 2019, UNICEF began to conceptualize a low-cost solution to meet the cooking, heating and insulation needs of ger households in urban areas. Working with partners in a multi-disciplinary team, core design workshops were held to map the issue and find solutions, and to conduct ethnographic research in communities.

The CHIP installed in a ger in Mongolia.

Photos: © UNICEF Mongolia

CHIP is installed on a wooden cabinet with an outlet for electric appliances, including electric stoves. Three electric heaters are attached to the wooden cabinet which face each side of the ger to transmit heat equally. CHIP has a thermostat that automatically adjusts the temperature in the ger.

A ger with CHIP improves insulation by utilizing synthetic textiles – a thick tarp-like, durable and dense material with a layer of insulation – to better hold heat and block external wind. Heat loss through a joining point between the floor and wall is reduced as it is covered with this synthetic insulation. Ventilation is ensured through an air filter at the door and an exhaust air opening attached to the top opening of the ger, which leads to a constant circulation of air within the ger.

CHIP consists of three separate packages

Cooking

- The electric heating system provides the means for electric cooking methods including standard electric stoves, cooktops and kettles

Photos: © UNICEF Mongolia

Heating

- Thermostat
- Time relay
- Wooden cabinet
- Electric heater
- Hygrometer

Insulation and ventilation

- Top opening insulation
- Door insulation
- Door frame insulation
- Wall bottom edge insulation with lower part of felt layer
- Wall bottom edge insulation
- Floor vapour-proof layer
- Water and wind-proof layer
- Vapour-proof layer
- Exhaust air opening attached by top opening layer
- Air filter installation ger door
- Cover for the circular ceiling window

UNICEF worked closely with the School of Civil Engineering and Architecture of the Mongolian University of Science and Technology, local governments, University of Pennsylvania and Washington University, St. Louis, in the USA to design and improve CHIP and measure thermal comfort and indoor air quality. A pilot phase of CHIP was launched in 2019 in Bayankhongor province, targeting 200 of the most vulnerable households. Furthermore, the Mongolian Sustainable Finance Association and People in Need collaborated in implementation of innovative and inclusive financing tools, supply and logistics chain development and community outreach and advocacy.

Smog Free Bayankhongor

Bayankhongor Provincial government and UNICEF were instrumental in developing and implementing the Clean Air Action Plan which provided the basis for replicating the successful pilot in Umnugovi and Govi-Altai provinces. Provincial government allocations of CHIP in these three provinces are based on criteria that targeted vulnerable households including those with children under 5; households below livelihood thresholds; and disabled persons.

As a result of UNICEF-supported evidence on air pollution, the government has adjusted its national policies and scaled up support for CHIP: subsidies and financial incentives enabled households to purchase CHIP and subsidized loans were provided at 3 per cent interest, which was substantially lower than the 15-20 per cent market price in 2022.

Bayan, 8, lives in a ger which received CHIP three years ago. "It's made a big difference," says his grandmother, Dulmaa Bat Ochir. "I have a coal stove and there's a lot of smoke. I feel the difference when I come to this ger. My grandchildren used to always be sick. Now that's changed" after CHIP was installed in their ger.

CHIP financing scheme

UNICEF and partners developed a blended financing mechanism to make the package accessible to low-income households by securing government support for subsidized green loans through commercial banks, together with project subsidies. The financing scheme comprised a subsidy from local government and project funding, green loans subsidized by either the government (Ministry of Environment and Tourism) or private sector through non-banking financial institutions, and personal investment. The positive results of CHIP led the government in 2020 to provide green loans, initially at 8 per cent interest but reduced to 3 per cent in 2022, making CHIP more affordable to low-income households.

As of May 2025, 4,700 households and 25 ger kindergartens in Ulaanbaatar and 13 provinces were using CHIP.

In August 2025, UNICEF signed a Memorandum of Agreement with the Municipality of Ulaanbaatar to provide CHIP insulation and ventilation packages to 1,361 households. The municipality will provide over US$500,000 for this partial CHIP, which cost US$420 each. A full CHIP costs US$900, but because of electricity shortages in Ulaanbaatar, these households will use gas heaters – which will be supplied directly through the municipality.

The gas heaters will include a cooking component and built-in sensors for gas leakage detection. They will operate in multiple modes, including normal, energy-efficient (eco) and automatic modes. Emitting heat from three sides, overall efficiency and comfort will be optimized. The gas heater is equipped with a chimney system that draws in fresh air from outside, ensuring that indoor air is not used for combustion. The used air and emissions are then expelled through the chimney, making the gas heater safer and more suitable for indoor environments.

Challenges in implementing CHIP

- Spatial and temporal variability in ger districts impacts the value added of CHIP to improved ambient air quality
- Capacity of the national electric grid limits allocation of CHIP in some areas
- Affordability: Low-income households can often only afford CHIP with local government subsidies or green loans
- Cultural beliefs regarding the importance of fire for wellbeing led to some initial resistance to transition to CHIP
- Quality control: CHIP promoted local businesses, but training and quality control is important to ensure minimum production specifications are met
- Training and monitoring of project workers and users is critical for proper installation and optimal functioning

CHIP performance analysis

Various quantitative and qualitative assessments were conducted between 2019 and 2022 to evaluate the project. On three key metrics - energy efficiency, operational cost, and thermal comfort – CHIP was found to deliver significant and demonstrable improvements over the traditional coal stove system. Qualitative feedback from households that installed CHIP was overwhelmingly positive, with users reporting transformative improvements in health, convenience, safety and overall quality of life.

Benefits for households with CHIP

Cost saving for fuel: Lower heating costs than wood and coal

Time: 40–90 minutes saved each day by households using CHIP which benefited

Comfort: More consistent and controllable indoor temperatures = better sleep and improved family dynamics

Waste: Less waste (ash) pollution in the ger = less cleaning of the home

Other benefits: Savings on medical costs and reduced sick days for illness

Source: UNICEF, *Impact of Air Pollution on Maternal and Child Health project*, 2018–2023.

Notably, studies revealed that CHIP did not significantly reduce the indoor concentrations of $PM_{2.5}$ because ambient smog in the ger districts infiltrates gers which are not completely airtight. Only slight improvements in child health were found in the study conducted by UNICEF and NCPH on the impact of CHIP on indoor air quality and maternal and child health in Bayankhongor and Govi-Altay provinces. For children under 16 years old with a CHIP, they had 1.2 per cent lower carboxyhaemoglobin levels and higher oxygen saturation in arterial blood compared to a similar cohort from non-CHIP households.

Lessons from CHIP in Mongolia

A collaborative architecture and systematic approach: CHIP highlights how clean air solutions exist but need to be accompanied with a holistic solution to truly protect children's health from all sources of air pollution. This solution should involve all stakeholders working collaboratively for a low-cost, culturally appropriate response to correcting the country's air pollution crisis.

Government commitment and funding: CHIP was implemented in close partnership with the Government of Mongolia at both national and provincial levels. Key partners included the Ministry of Environment and Tourism, the Ministry of Health, the Ministry of Education and Science, and the National Committee for Reducing Environmental Protection. Provincial government commitment and support proved critical for implementation and funding to scale up CHIP at local levels. Since 2019, the government has allocated approximately US$2 million for CHIP.

Partnering with academic and research partners: For research, development, and rigorous evaluation, UNICEF partnered with leading academic institutions. The Center for Environmental Building and Design at the University of Pennsylvania and the Building Energy Efficiency Center at the Mongolian University of Science and Technology were instrumental in the technical design, monitoring, and performance analysis of CHIP. An air pollution research group at Washington University in St. Louis provided expertise on air quality monitoring.

Community engagement and mobilization for social and behavioural change: Community engagement was a key factor in generating demand for CHIP. To enable and facilitate community engagement, UNICEF worked with the local government to arrange community partners for implementation and roll out, including the national non-government organization, GER Hub, and the international non-government organization People in Need. Community involvement in the project was essential to find out what households wanted, what worked and what didn't work and why – ensuring culturally appropriate responses. Communities' uptake of CHIP was found to be limited by their reluctance to undertake the 3 per cent loans from banks, and the bureaucratic application process for CHIP.

UNICEF's role

Coordination: UNICEF has played a fundamental role as lead agency and central convener in coordinating a cross-sectoral group of stakeholders from government, academia, international organizations, and private technical companies to examine ways of solving the air pollution crisis, by ensuring that technical expertise, production capabilities, and policy frameworks worked in harmony. The programme has been significantly bolstered by financial and technical support from key international partners, including the Swiss Agency for Development and Cooperation (SDC), Moncler, and the Governments of the Netherlands and Canada.

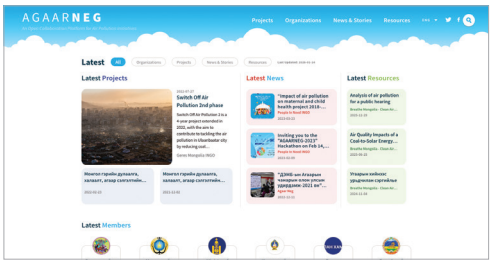
This leadership in coordination continues today, with UNICEF actively working alongside the Mongolian University of Science and Technology and local production enterprises to scale and sustain impact. For the private sector, this means any investment is leveraged across a broad coalition of partners, multiplying the return on funding. By supporting UNICEF's coordination role, private sector partners can help unlock synergies across sectors, accelerate innovation, and create market opportunities for sustainable solutions—while directly contributing to healthier communities, stronger local economies, and measurable social impact.

Advocacy and technical support to strengthen national policies: UNICEF has generated and shared critical evidence to influence Mongolia's energy transition. Evidence generated from UNICEF-supported pilots and research informed government cabinet decisions, national building codes, and the Clean Fuels and Vehicles Working Group work plan. UNICEF also facilitated policy dialogues and technical sessions with ministries to advocate for alternatives to coal, including gas heating transitions and pilots of renewable and hybrid energy solutions. By combining research with advocacy, UNICEF has positioned child health at the centre of national clean-energy decision-making.

UNICEF supported the development of national building codes requiring schools, kindergartens, and hospitals to be equipped with mechanical ventilation systems with mandatory filtration. Pilot installations of air ventilation systems in kindergartens have resulted in more than 1,500 children breathing cleaner indoor air. In addition, 150 kindergarten teachers and administrators received training on indoor air quality measurement, which included simple effective ways to improve indoor air quality.

Teen advocates for clean air in Mongolia

Raising awareness: In 2019, UNICEF started working with the Scout Association of Mongolia to establish the Youth for Climate Change and Clean Air Network (YOUCCAN). YOUCCAN supported 3,250 youth in mapping air pollution which helped educate their peers and communities about the harmful impacts of air pollution and ways to stay safe. In 2021, UNICEF and the Parliament of Mongolia launched the Teen Parliament initiative to inspire and empower children and adolescents to become environmental and climate champions.



In 2021, UNICEF launched the Agaar Neg website, a platform for translating real-time data into practical guidance for families, communities, and policymakers.

Affordable clean fuel options: To facilitate the further development and scale up of CHIP, UNICEF is working on several solar energy pilots. These include: a community solar system project with local government and private sector that will be piloted during the winter of 2025/2026; a community hybrid solar system for households and peri-urban households in Ulaanbaatar and provincial centres; and a herder's community off-grid solar system.

Mitigating the health impact to children and pregnant women: To reduce the health impact to children and pregnant women after their exposure to air pollution, UNICEF works to strengthen the capacity of the health system. Over 500 community health workers have been trained to detect and manage pneumonia, counsel families, and provide first-line antibiotics. Pneumonia and influenza vaccination, alongside nutritional guidance including antioxidants and vitamins, have been promoted to strengthen resilience. Environmental health modules have been integrated into training curricula and the Maternal and Child Health 'Pink Book' revised to embed air pollution considerations into everyday care.

Further government action required

Increased government commitment: An integrated multisectoral approach at national level is urgently required to effectively address the air pollution crisis in Mongolia and mitigate any further harm to public health, especially to the most vulnerable groups. Policy, planning and budgeting at national and sub-national levels need to be aligned with increased resource allocation for successful outcomes. To date, only three provinces (Gobi Altai, Bayankhongor and Umnugovi) have adopted local air pollution mitigation action plans – further advocacy is required to encourage all 21 provincial governments to adopt this important legislation. The government has announced that it plans to ban 'raw coal' in Ulaanbaatar by 2026, and is strongly encouraged to continue policy development for clean fuel options, to reduce all types of air pollution.

Surveillance systems must be strengthened for improved evidence on the impact of air pollution on public health – in particular children's health – specifically pneumonia and respiratory outcomes. Further research is required to explore the correlation between indoor and outdoor air pollution in ger districts and the impact of this pollution on other less polluted urban areas. Increased government funding is required to expand the capacity of institutions such as CLEM and the National Center for Public Health.

[i] National Statistics Office of Mongolia. (n.d.). Population Data. Retrieved from www.1212.mn.

[ii] Ministry of Environment and Climate Change's Emission Source Inventory, the air pollution sources, 2024.

[iii] World Health Organization (WHO), WHO Air Quality Standards database (update 2025), Version 2.2, Geneva, World Health Organization, 2025.

[iv] Ha, Y., Kim, et al., Spatiotemporal differences on the real-time physicochemical characteristics of PM2. 5 particles in four Northeast Asian countries during Winter and Summer 2020–2021, *Atmospheric Research*, 283, p.106581.

[v] Ibid.

[vi] WHO, Air pollution and child health: prescribing clean air: Summary, Geneva, World Health Organization, 2018 (WHO/CED/PHE/18.01).

[vii] UNICEF Mongolia, Climate Change, www.unicef.org/mongolia/environment-air-pollution#:~:text=On%20the%20coldest%20days%20of,settlements)%20during%20the%20cold%20season.

[viii] https://ceh.unicef.org/spotlight-risk/air-pollution.

[ix] It should be noted that in Mongolia's context, children spend the majority of their time indoors because of the long winter period.

[x] Mongolia's Air Pollution Crisis: A call to action to protect children's health www.unicef.org/eap/sites/unicef.org.eap/files/press-releases/eap-media-Mongolia_air_pollution_crisis_ENG.pdf.

[xi] Mongolia's Ulaanbaatar breathes easier after clean-up of air quality, ADB, 17 December 2021, www.adb.org/results/mongolias-ulaanbaatar-breathes-easier-after-cleanup-air-quality.

[xii] https://ceh.unicef.org/

[xiii] These included: the National Center for Public Health (NCPH); the National Agency for Meteorology and Environmental Monitoring; the Mongolian National University of Medical Sciences; the Mongolian University of Science and Technology; the University of Birmingham (United Kingdom); Washington University in St. Louis (United States); and Waterloo University (Canada).

[xiv] www.unicef.org/mongolia/environment-air-pollution.

[xv] UNICEF and Washington University in St. Louis, USA.

[xvi] UNICEF, Impact of Air Pollution on Maternal and Child Health Project, 2018-2023.

[xvii] Ibid.

UNICEF's Healthy Environments for Healthy Children (HEHC) is a global programme to protect children's health from climate change and environmental degradation, including air pollution. Through research, advocacy, data generation, and practical interventions, UNICEF works to reduce children's exposure to these risks and strengthen health systems to address their health impacts. UNICEF's work in Mongolia exemplifies this approach—combining evidence generation, public engagement, policy advocacy, and concrete solutions such as CHIP to tackle severe household air pollution and deliver lasting, system-wide change with children at the centre.

In Mongolia, this work is embedded within UNICEF's broader support for children's health, education, protection, WASH, climate action, and social inclusion. Working closely with the government, UNICEF Mongolia strengthens health and nutrition services, expands early childhood learning – including for nomadic and remote communities through mobile kindergartens – advances child protection and adolescent mental health, improves water, sanitation and hygiene (WASH), and advocates for children's rights in national policymaking.

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Healthy Environments for Healthy Children

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