Adolescents Take Action to Mitigate and Alleviate the Harmful Effects of Air Pollution in Mongolia and Viet Nam
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Programming Objectives:
Address the associated and disproportionate adverse effects of air pollution on children and adolescents by reducing their exposure and the amount of air and climate pollutants and improving air quality. This supports their health, development, learning, protection, participation, psychosocial and overall wellbeing.

UNICEF’s Approach:
Apply an adolescent-centered approach to programming and advocacy for reduction of air pollution that can concurrently bring about positive developmental, health, environmental, and climate outcomes for adolescents and the wider society.

Context
Children and adolescents are highly vulnerable to air pollution as they grow up and develop, but current trends show that the majority of adolescents living in lower-middle-income countries are exposed to air pollution above the World Health Organization (WHO) recommended levels. Air pollution is increasing due to rapid urbanization, unclean energy, heating and cooking fuels, transport and power plant emissions, forest and peatland fires, and slash-and-burn farming. Across the East Asia and Pacific Region (EAPR), air pollution is also linked to climate change both as a cause and an effect.

Exposure to outdoor and indoor air pollution can lead to life-altering and life-threatening chronic respiratory diseases like pneumonia, bronchiolitis, or asthma, and adversely affect cognitive development, endocrine functions, immune systems, and low birth rate or pre-term birth. Higher pollution levels have also been linked to lower academic performance due to sickness, missed school, and an increased risk of school dropout. For instance, schooling can be interrupted due to prolonged days of toxic air that close schools and adolescents’ concentration can diminish without outdoor play. Mongolia and Viet Nam are two countries where children and adolescents are highly impacted by air pollution.

This case study series shows how to accelerate outcomes for adolescents in support of the Sustainable Development Goals, including Good Health and Wellbeing (SDG 3); Quality Education (SDG 4); Affordable and Clean Energy (SDG 7); Sustainable Cities and Communities (SDG 11); Climate Action (SDG 13); and Partnership for the Goals (SDG 17).
In Mongolia, air quality levels during winter in the dense and unplanned capital city of Ulaanbaatar have been recorded at levels averaging 500 ug/m³ and reaching higher than 1000 ug/m³ at some points in time (20-40 times higher than the WHO recommended levels), putting children, adolescents, and the population at significant risk. The worse air pollution levels occur during the harsh winter months because suburban homes use raw coal to heat their houses or Gers. While this traditional heating source has less impact on air pollution in rural areas, in the city it has resulted in the worst air pollution levels recorded in all the region.

In Viet Nam, air pollution is most severe in the urban cities of Ho Chi Minh City (HCMC), Ha Noi and Da Nang—primarily because of transport emissions, nearby agricultural burning, construction activities, and coal power plants. Rural communities have high emissions due to open burning of farmlands and waste. These activities generate more than 618,000 tons of nitrogen oxides, 667,000 tons of sulfur oxides, and 6.8 million tons of carbon monoxide annually, which is affecting the public health. Vietnam was ranked as the 15th worst country in the world for harmful air quality (PM2.5 exposure) in 2019, with predictions that air pollution will worsen in the coming years, which could lead to serious, lasting harm.

UNICEF Response: Key Programmes and Outcomes

Across EAPR, UNICEF’s approach to mitigating and alleviating the adverse effects of air pollution consists of working with and supporting partners across sectors through four main strategies that aim to benefit the areas of child health, development, environment and climate (see graphic). While the response to air pollution is often driven by the needs of young children, pregnant women, and elderly people who are the most vulnerable to its effects, greater attention is starting to be paid to adolescents. This is not only due to their health and development needs, but to the active role they play in raising awareness, supporting data collection, positively influencing community, family and peer behaviors, and in demanding air quality policies to be more child- and adolescent centered. In Mongolia and Viet Nam, adolescents are actively participating in all these activities; contributing their valuable insight, time, ideas, and knowledge to mitigate and alleviate the harmful effects of air pollution on communities and individuals.

Improving air quality in Mongolia

In 2015, as part of its “Children and Environmental Change in Mongolia” programme, UNICEF and public health partners began researching air pollution-related health impacts on children living in Ulaanbaatar to develop and advocate for mitigation measures. This resulted in the Mongolia National Center for Public Health (NCPH) and international partners, with UNICEF support, developing a clear road map for reducing health impacts from air pollution, transitioning to clean energy, and raising...
awareness on how the government can improve air quality to the benefit of children and adolescents. In support of this programme and road map, UNICEF engaged adolescents to research how air pollution impacts them through a citizen-science approach, and to take a leading role in educating others and mobilizing local action.

Air Pollution Youth Mappers Programme
Adolescents from two selected districts of the capital, Ulaanbaatar, are actively involved in addressing air pollution through data collection that aims to document the adverse effects of air pollution levels in the city. In 2019, 75 adolescents from 25 high schools volunteered as community researchers. The programme was a collective effort where the Scout Association of Mongolia managed implementation; the school administrators oversaw activities and supported logistics; high school staff (mainly teachers and social workers) facilitated and supported the youth mappers teams; and youth volunteers and Scout rovers led the teams after receiving training on how to do so. In the programme, the information and skills the youth mappers learned included:

- Where air pollution in their community comes from and its harmful effects on health, cognitive development, education, etc.;
- What are the global guidelines and plans to reduce air pollution, and how this is applied in Mongolia;
- How to protect themselves, their peers, and families from adverse effects of air pollution;
- How to measure air pollution levels in their communities using simple air quality monitors provided by UNICEF Mongolia to note pollution indexes and log results in and outside of school (monitors include the Laser Egg and IQair pollution monitors);
- How to develop team strategy plans that respond to their ideas for reducing air pollution, including how to set goals and objectives, identify possible obstacles, and share their ideas; and
- How to do digital mapping, photography, and blogging to better communicate for greater awareness raising and advocacy influence.

Because many of the local communities do not have knowledge and information about indoor and outdoor air quality, sharing the information they gained on air pollution levels with their peers and families was the start of more targeted efforts in advocating for political and social change. To this end, the Air Pollution Youth Mappers worked to accomplish tasks on spot detection of air pollution levels and actively participating in social campaigns (social media posts, vlogs, posts on UNICEF’s “Voices of Youth” platform, school events, province-level event to empower volunteers).

These events aimed at increasing awareness on the impact of air pollution on children’s health, development, education, etc., and included maps of the most polluted areas in the community. In early 2020—before the COVID-19 response closed schools—the adolescents used the Air Quality Index data they gathered to identify (by the AQI number) whether the air is good, moderate, unhealthy for sensitive groups, unhealthy, very unhealthy, or hazardous.

The adolescents used the data to develop and disseminate awareness messages and materials for their peers, teachers, and parents—including data about air quality levels, the sources and impact of air pollution, and on maternal and child health; and good practices for combating air pollution in their community. The Air Pollution Youth Mappers programme showcased the strength of adolescent engagement and is being used as an example for other partnerships at local to global levels. Nationally, for instance, in 2020, UNICEF and the Scouts Movement of Mongolia formalized a partnership agreement to scale messaging and action for and by adolescents to reduce the adverse effects from air pollution. This built on prior efforts by the Scouts to incorporate air pollution awareness-raising into its activities.

More than 1,000 adolescents learned about air pollution at the Mongolian National Scouts Jamboree in mid-2019.
Youth Volunteer Engagement to support A Smog Free Bayankhongor Programme by 2022

The capital of Mongolia, Ulaanbaatar, often receives the most attention about its air pollution. However, Bayankhongor (300 miles Southwest of Ulaanbaatar) is the highest polluted province in Mongolia. Air quality here is poor, with consistently high recordings of PM2.5 during the winter months, exceeding WHO accepted levels by 24 times times. This is mostly due to a thick smog of toxic particles that spew from over 7,000 households in the province that burn coal for heating and cooking. To address the problem, in 2019, the Bayankhongor local parliament approved a clean air action plan and the Smog Free Bayankhongor Programme to be achieved by 2022 with the main objective of protecting maternal and child health from adverse effects of air pollution.

As one action towards this aim, the Authority of Family, Child and Youth Development and local government authorities from Bayankhongor, with UNICEF support, recruited and trained 300 young volunteers and 90 community volunteers in Bayankhongor to promote a smog-free Bayankhongor. In its first year, the young volunteers reached nearly 6,000 people (approximately 20 percent of Bayankhongor province’s population) through social media and face-to-face interactions.

Youth for Clean Air Network: YouCAN

Building on the Bayankhongor youth volunteer engagement activities and the Ulaanbaatar Youth Mapper programme run by the Scouts Association of Mongolia, UNICEF and partners launched the Youth for Clean Air Network (YouCAN) programme in 2020 as a way to continue adolescent-led air quality monitoring and dissemination of evidence-based information aimed at reducing the risks of air pollution. After the initial training of the YouCAN members, many of the awareness-raising activities by the young people moved online due to the COVID-19 pandemic that limited their mobility. This included their messaging that was used during YouCAN’s online live launch event in June 2020 that reached adolescents and youth in urban and rural areas nationwide.

In 2021, YouCAN will expand into four additional provinces and two districts in Ulaanbaatar for in-person training and implementation. The longer-term vision by UNICEF, the Scouts of Mongolia, the Government and other partners is to scale YouCAN, especially by expanding opportunities for young people themselves to be agents of change in Mongolia so that they are able to develop, articulate, and innovate solutions for reducing air pollution in their homes, schools, communities, and cities.
Creating a pathway for adolescents to drive environmental change in Viet Nam

Air pollution in Viet Nam is largely caused by transportation, construction, agricultural burning, and coal power plants, and not by household energy use as in Mongolia. Different mitigation strategies are thus required to address the adverse effects of air pollution on children and adolescents. To implement solutions and address this problem at scale nationwide, the Government is installing air quality monitors across the country to fully understand, document and monitor the breadth of the problem. It is also developing the first action plan for addressing air pollution in schools through the Ministry of Education and Training (MOET), with UNICEF’s support. The plan includes air purification recommendations, air quality guidelines for when to wear a mask, safe air quality levels for participating in physical education classes, standards for managing the air condition at schools and a guidance on facilitating student-led initiatives to address climate change and air pollution challenges.

Content for the school action plan is being informed by input from children and adolescents. UNICEF Viet Nam facilitated nationwide consultations with students and student councils to discuss, address, and develop recommendations. In relation to climate actions in schools and in city/national policies, UNICEF also partnered with youth-centered NGOs to elevate adolescent concerns and solutions to the climate crisis in decision-making processes. The active participation by adolescents resulted in recommendations that are now included in the draft action plan for how to mitigate air pollution in schools.

The action plan also responds to evidence on the indirect links between climate change, air pollution, and education from the UNICEF EAPR report, It’s Getting Hot. This report was validated through a national consultation with adolescents and includes a Smart School Framework with indicators for climate-responsive schools that UNICEF Viet Nam is contextualizing to the Vietnamese school system together with the MOET.

Adolescents Offer Innovative Ideas to Achieve Clean Air

One of the adolescent consultations towards developing the school action plan happened through UNICEF Viet Nam’s collaboration with the NGO Clean Air Asia and the Saigon Innovation Hub (SIHUB) and it led to the establishment of the New Solutions to Air Pollution innovation initiative. This initiative engaged adolescents, youth, teachers, and club leaders from six innovation hubs located at universities, secondary and high schools in Ho Chi Minh City, all of which are also connected to UNICEF’s Child Friendly Cities Initiative.

Through idea- and solution-generating activities, 110 adolescents from the six innovation hubs first learned about the adverse effects of air pollution at community and school levels. They then shared their learnings with an estimated 4,500 peers and community members through various awareness-raising activities and channels, including social media. The six innovation hub teams also spent two months...
developing and testing solutions and prototypes to address concerns related to air pollution. They pitched these at a Clean Air Day event that was attended by more than 100 participants, including representatives from UNICEF, academia, educational institutes, artists, private sector, government agencies, and children and adolescents. The purpose of the pitches was to receive feedback on the solutions and potential implementation of them, and to discuss how all the various stakeholders participating in the event could commit and contribute to addressing the adverse effects of air pollution in their communities.

The solutions and prototypes pitched by the adolescents included developing a filter to clean the smoke discharged from chimneys at restaurants and street vendors around the school; promoting the installation of air quality monitoring devices in and around schools; and advocating for clean energy public transportation and traffic behaviour change (i.e. using bicycles or walking instead of scooters and cars), and air quality warning systems. The six innovation hub teams received hands-on trainings, coaching and mentorships during the co-creation, testing, and piloting phases of their ideas.

The New Solutions to Air Pollution initiative also provided concrete recommendations for the draft action plan that the MOET was developing to address air pollution in schools as it offered innovative and concrete ideas for mitigating air pollution. As part of the initiative, UNICEF Viet Nam and key partners—including SIHUB, the United States Consulate, the RMIT University Vietnam, and Clean Air Asia—provided air quality measuring sensors to 13 local partners, including schools and NGOs supporting marginalized children and adolescents in HCMC. Students were part of the decision-making on where to locate the sensors; and the resulting data has been used in the schools to engage students in air pollution management.

The relationships built through the New Solutions to Air Pollution initiative and Clean Air Day event led to academic partnerships such as between UNICEF Viet Nam and the Air Pollution and Climate Change Department at the Institute of Environment & Resources (IER), Vietnam National University. Together they provide expert advice to air quality improvement projects at schools to help children and adolescents understand the issues of air quality and pollution and develop local solutions to it.

Son, 7th grade student, was part of an innovation hub team that participated in the New Solutions to Air Pollution innovation initiative. His team developed a “Dust-Reducing Castle” prototype for a chimney to decrease air pollution by restaurants and food stalls near his school. He and his team are interested in developing new products, proving their feasibility, and introducing it to many people to increase their awareness. The team recently submitted the design to a national science, technology, engineering, and math (STEM) contest.
Lessons Learnt

Through the UNICEF Mongolia and UNICEF Viet Nam programmes, the following lessons emerged:

Promote adolescents as legitimate stakeholders and partners
Historically in Mongolia and Viet Nam, adolescent participation in public policy has been minimal. The Mongolia YouthMappers and Bayankhongor volunteer programmes and the involvement of adolescents in the Viet Nam school action plan decision-making and the HCMC Innovation Hubs aimed to change this. They did so by highlighting and providing evidence on the value of their contributions and ability to advocate for change. For instance, in Mongolia, adolescents shared photos of their lived experience of healthy air quality days verses unhealthy air quality days, accompanied by scientific readings that they measured. This was influential in increasing attention on air pollution and its impacts on adolescents in the country. The social innovation activities in Viet Nam also helped increase attention on the value of engaging young people in a systemic way as recommended in the MOET school action plan, and to connect them with partners to find innovative solutions to local air pollution problems.

Other ideas for adolescent engagement include increasing local to global opportunities for them to showcase their ideas (i.e., at health, education, child protection, or climate change events), to participate in decision-making, and to advocate for increased commitment and urgent action from state parties (i.e., to demand reduction of pollution and demand governments and businesses create more opportunities in the green economy). In addition, more targeted efforts are required to ensure that key authorities, who make decisions related to air quality, not only show up at adolescent events but are open to being inspired, influenced, and led by adolescents.

Invest in long-term action
That said, while these initiatives were influential in raising awareness, the UNICEF Country Offices recognized that for solutions to be meaningful, they need to be more than a singular activity. It takes coaching and budgets for adolescents to turn their ideas into action, including learning how to advocate for their own solutions being taken seriously. For instance, one-time events like the Clean Air Day event can have a stronger impact if paired with mechanisms for adolescents to participate in longer-term formal processes and with resources for adolescents’ ideas to meaningfully influence innovation, programmes, and policies after the event. For instance, to address this, UNICEF Viet Nam is advocating for the MOET’s Climate Smart School Framework to include “student-led climate action initiatives” as one of the key indicators for climate-responsive schools.

Support teacher and parent training
Investing more in parent and teacher training, including training led by adolescents, can help improve the intergenerational understanding of what measures to take in order to reduce exposure to air pollution and improve air quality. Because air pollution has been a daily part of people’s lives for so long, as the situation in Mongolia and Viet Nam show, many adults are unaware of its impacts on adolescents or solutions they can contribute with to improve air quality. As a strategy to increase awareness of teachers and parents, Mongolia and Viet Nam integrated air pollution lessons into school curricula to raise awareness of teachers and students. This led to an investment in action planning by adolescents for them to raise awareness and promote solutions within their homes and communities.

As an example, the Vice Minister of Education and Training and UNICEF Viet Nam recently launched a UN-accredited (UN CC Learn) teacher training—technically supported by UNICEF and adapted for the Viet Nam context—that highlights how children and youth are impacted by climate change and air pollution, how their resilience can be strengthened, and how they can address this challenge. After this course, teachers are equipped to strengthen students’ climate change skills (i.e., green habits) and facilitate student-led activities to mitigate impacts of climate change and air pollution. The course aims to reach one million teachers in Viet Nam.
**Involve adolescents in communication campaigns**

Public health institutions have long been running campaigns about the adverse effects of air pollution on health. However, most of their communication for adolescents has been developed by adults. During the YouCAN project in Mongolia, public health specialists found that their campaigns and general efforts were more effective both in reaching and responding to calls-to-action when young volunteers helped develop them. The adolescents involved helped the health specialists to decide which platforms to use, what time of day was best to reach their peers, which actors could be the most influential in sharing information, and how to make communication materials more adolescent-friendly both in the visuals, language, and delivery.

**Conclusion**

Across the East Asia and Pacific region, the type of pollutants, their root causes, and approaches that account for context and culture differ from country to country. However, efforts to mitigate the impacts of air pollution and improve air quality share a similar aim: for children and adolescents to thrive in a healthy environment with good health and development. As programming from Mongolia and Viet Nam has shown, proactive action on air pollution is stronger when adolescents are involved—not only in singular events, but as long term active and equal stakeholders, amateur citizen scientists, communicators, and advocators.

Strategic support is required when engaging them through multisectoral partnerships (i.e., related to environment, technology, education, and health fields), in collaborations with innovators, mentors, and decision-makers; in inclusive school action planning; and through volunteering opportunities. These are just a few ways adolescents are participating as agents of change in creating better air quality in their schools, communities, countries, and worldwide.

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**Further Readings and Information**

- Clear the Air for Children Summary | Full Report
- It’s Getting Hot report
- Mongolia’s air pollution crisis: A call to action to protect children’s health
- New Solutions to Air Pollution - 2019 workshop in Vietnam
- Reducing Impacts of Air Pollution on Maternal and Child Health, A rapid assessment of intervention strategies in Bayankhongor, Mongolia
- UN CC: e-Learn: Think, Talk, Act Climate
- Video on Mongolia’s air pollution / Video on a Smog Free Bayankhongor

**Acknowledgments and Contacts**

- Bolorchimeg Dagva, Adolescent & HIV/AIDS Specialist, UNICEF Mongolia, bdagva@unicef.org
- Mungunkhishig Batbaatar, Knowledge Management Officer, Air Pollution, UNICEF Mongolia, m.batbaatar@unicef.org
- Simone Vis, Chief Education, UNICEF Viet Nam, svis@unicef.org,
- Le Anh Lan, Education Specialist, UNICEF Viet Nam, jalan@unicef.org

**Endnotes**

2. www.who.int/health-topics/air-pollution#tab=tab_2
3. WHO guidelines stipulate that PM2.5 not exceed 10 μg/m³ annual mean, or 25 μg/m³ 24-hour mean: https://apps.who.int/nris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06_02_eng.pdf;jsessionid=218FC227E3E3B543F8D359BEC7DF58D?sequence=1
5. www.unicef.org/environment/files/Danger_in_the_Air.pdf
6. www.unicef.org/eap/reports/it-getting-hot
7. Data collected by the Government of Mongolia (GoM) reported Jan. 30, 2018, at 5 pm, air pollution levels of 3,320 μg/m³—133 times the recommended daily average concentration (See http://agaar.mn/index for daily reporting).
8. A Ger is a traditional Mongolian home, which consists for the most part of felt covers and wooden columns; it can be easily assembled and disassembled to suit traditional nomadic life.
10. www.iqair.com/world-most-polluted-countries
14. www.who.int/airpollution/guidelines
15. https://waqi.info
16. PM2.5 is particulate matter with a median diameter of less than 2.5 microns, approximately one thirtieth the width of average human hair.
18. www.unicef.org/eap/reports/it-getting-hot