Clear the air for children

unicef 70
70 YEARS FOR EVERY CHILD

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Note on maps: All maps included in this publication are stylized and not to scale. They do not reflect a position by UNICEF on the legal status of any country or area or the delimitation of any frontiers. The dotted line represents approximately the Line of Control agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the Parties. The final boundary between the Republic of the Sudan and the Republic of South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

This report, additional online content and corrigenda are available at www.unicef.org/environment

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Clear the air for children

The impact of air pollution on children

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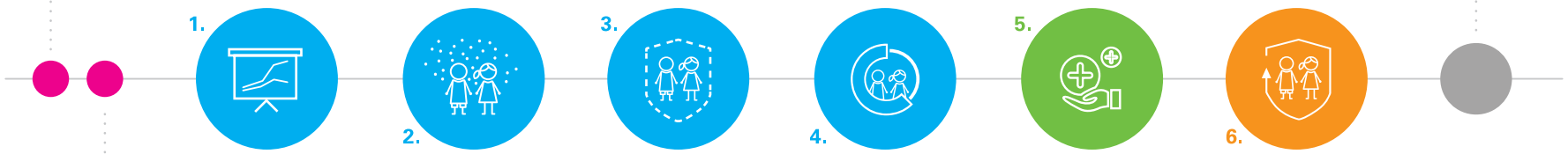

Foreword

It causes miscarriages, early delivery, and low birth weight.

It contributes to diseases that account for almost 1 in 10 of all deaths of children under the age of five.

It can harm the healthy development of children's brains.

It is a drag on economies and societies, already costing as much as 0.3 per cent of global GDP – and rising.

And in many parts of the world, it is getting worse.

'It' is air pollution. And as both this litany and this report show, the magnitude of the danger it poses – especially to young children – is enormous.

Children breathe twice as quickly as adults, and take in more air relative to their body weight. Their respiratory tracks are more permeable and thus more vulnerable. Their immune systems are weaker. Their brains are still developing.

Ultrafine, airborne pollutants -- caused primarily by smoke and fumes -- can more easily enter and irritate children's lungs, causing and exacerbating life-threatening disease. Studies show these tiny particles can also cross the blood-brain barrier, which is less resistant in children, causing inflammation, damaging brain tissue, and permanently impairing cognitive development. They even can cross the placental barrier, injuring the developing fetus when the mother is exposed to toxic pollutants.

So urban children growing up too close to industrial sites, smoldering dumps, and electrical generators that burn biomass fuels like dung … rural children living in unventilated homes where food is prepared on smoking cook stoves … refugee and migrant children staying in tents filled with wood smoke … All these children are breathing in pollutants night and day that endanger their health, threaten their lives, and undermine their futures.

Many of these children are already disadvantaged by poverty and deprivation. Some are already at heightened risk from conflicts, crises and the intensifying effects of climate change. Air pollution is yet another threat to their health and wellbeing – and yet another way in which the world is letting them down.

The sheer numbers of children affected are staggering. Based on satellite imagery, in the first analysis of its kind, this report shows that around the world today, 300 million children live in areas with extremely toxic levels of air pollution. Approximately 2 billion children live in areas where pollution levels exceed the minimum air quality standards set by the World Health Organization. These data don't account for the millions of children exposed to air pollution inside the home.

The impact is commensurately shocking. Every year, nearly 600,000 children under the age of five die from diseases caused or exacerbated by the effects of indoor and outdoor air pollution. Millions more suffer from respiratory diseases that diminish their resilience and affect their physical and cognitive development.

As population grows … as countries continue to develop through rapid industrialization … and as urbanization increases, experts expect all these numbers to climb.

Unless we act now.

Developed countries have made great strides in reducing outdoor air pollution and protecting children from indoor pollutants. Developing countries – both low and middle income – can and must do so too.

Most urgently, this means promoting greater understanding of the dangers of air pollution – among governments, communities, and families. And it means providing parents with more information on how to protect their children from indoor pollutants. This includes improved ventilation, so smoke does not linger … better insulation, so less heating fuel is burned … and cleaner cook stoves. These are all practical solutions that can make a big difference.

Outside the home, it means improving urban planning so schools and playgrounds are not located in close proximity to sources of toxic pollution. It means improving waste disposal systems and increasing public transportation options to reduce automobile traffic and the harmful fossil fuel emissions it produces. It means investing in sustainable energy solutions to reduce reliance on pollution-causing sources of energy.

It also means monitoring air pollution levels more carefully and including this critical data in our approach to other issues, like child health. Health workers who know a sick child has been exposed to high levels of pollution can diagnose illness more quickly, treat it more effectively, and prevent the compounding harm that pollution can cause.

Protecting children from air pollution is not only in their best interests; it is also in the best interests of their societies – a benefit realized in reduced health costs … in increased productivity … in a cleaner, safer environment … and thus, in more sustainable development.

We can make the air safer for children. And because we can, we must.

Anthony Lake
Executive Director, UNICEF

Executive summary and key messages

Around 300 million children currently live in areas where the air is toxic – exceeding international limits by at least six times.

Using satellite imagery of outdoor air pollution, this study found that around 300 million children currently live in areas where outdoor air pollution exceeds international guidelines by at least six times. In total, around 2 billion children live in areas that exceed the World Health Organization annual limit of 10 μg/m^3 (the amount of micrograms of ultra-fine particulate matter per cubic metre of air that constitutes a long term hazard).

Air pollution is linked directly with diseases that kill. In 2012, air pollution was linked with 1 out of every 8 deaths, globally – or around 7 million people.[1] Around 600,000 of those were children under 5 years old, globally.[2] Almost one million children die from pneumonia each year, more than half of which are directly related to air pollution.

Air pollution can considerably affect children's health. Studies have shown that air pollution is strongly associated with respiratory conditions such as pneumonia, bronchitis and asthma, among others. It can also exacerbate underlying health issues

Health Organization (WHO) indicates that urban outdoor air pollution has increased by about 8 per cent between 2008 and 2013.[5] Projections are unfavourable. According to the Organisation for Economic Co-operation and Development (OECD), under-five mortality could be 50 per cent higher than current estimates by 2050 as a result of outdoor air pollution.[6] Another study published in *Nature* found it could be even worse – doubling by 2050.[7]

Children are uniquely vulnerable to air pollution – due both to their physiology as well as to the type and degree of their exposure.

Air pollution can seriously affect the health of the foetus. Pregnant mothers are advised to avoid air pollution – just as they should avoid smoking or breathing secondhand cigarette smoke. Studies have shown that chronic exposure to high levels of particulate matter (PM2.5 – which consists of particulate matter with a median diameter of less than 2.5 microns, approximately one thirtieth the width of average human hair) is associated with higher rates of early foetal loss, preterm delivery – and lower birthweight.[8,9]