Second in-person meeting of the WHO Global Chemicals and Health Network
The WHO Global Chemicals and Health Network is a global forum for discussion among senior-level policy-makers and health ministry representatives to enhance health sector engagement and implementation of WHO Chemicals Road Map. The 2nd in-person meeting of the WHO Global Chemicals and Health Network will take place from 20 – 22 February 2024 in Geneva, Switzerland and includes four selected hybrid sessions to accommodate enhanced participation of Network members to address the impact of chemicals, waste and pollution on health.
WHO (20/02/2024)

JOURNAL ARTICLES
Air Pollution
Associations between landscape fires and child morbidity in southern Mozambique: a time-series study
Epidemiological evidence linking exposure to landscape fires to child health remains scarce. The authors assessed the association between daily landscape fire smoke and child hospital visits and admissions in the Manhiça district, Mozambique, an area characterised by frequent forest and cropland fires. In this time-series analysis (2012–20), the primary metric for exposure to landscape fires was fire-originated PM_{2.5} from smoke dispersion hindcasts. Daily numbers of hospital visits and admissions were extracted from an ongoing paediatric morbidity surveillance system. A 10 μg/m³ increase in fire-originated PM_{2.5} was associated with a 6·12% (95% CI 0·37–12·21) increase in all-cause and a 12·43% (5·07–20·31) increase in respiratory-linked hospital visits on the

CHILDREN’S ENVIRONMENTAL HEALTH NEWS
Ukraine two years: Children in frontline areas forced to spend up to 5,000 hours – equivalent to nearly 7 months - sheltering underground
Children in cities in Ukraine’s frontline areas have been forced to spend between 3,000 and 5,000 hours – equivalent to between four and almost 7 months – sheltering in basements and underground metro stations over the past two years, as air raid alerts sound above. Since the war escalated in February 2022, relentless attacks – resulting in around 3,500 air raid alerts in the Zaporizhzhia and Kharkiv regions and nearly 6,200 in the Donetsk region – have had a devastating impact on children’s mental health and ability to effectively learn. The winter months have been particularly horrific for children, with thousands sheltering in cold, damp basements as an escalation of attacks left many families without heating, access to water and electricity.
UNICEF (22/02/2024)

Press Releases
Record numbers of children seek life-saving care as Sudan war drives world’s worst displacement crisis
As Sudan’s brutal war hits the 300-day mark, widespread malnutrition, the world’s largest child displacement crisis, and a shattered health system threaten to kill far more children than the armed conflict itself. UNICEF is seeing record levels of admissions for the treatment of severe acute malnutrition (SAM) – the deadliest form of malnutrition – in the areas that can be reached with humanitarian assistance. Conditions in areas unreachable because of the fighting – where children are in most urgent need – are undoubtedly worse. Anecdotal reports point to a
following day. These results indicate a need for improved exposure assessment to better quantify the contribution of landscape fire smoke to child health in regions with scarce air pollution monitoring.

The Lancet Planetary Health

Impact of ambient air pollution and socio-environmental factors on the health of children younger than 5 years in India: a population-based analysis

Ambient air pollution and household environmental factors affect child health, particularly in low-income and middle-income countries. This study aimed to investigate the association between ambient air pollution (PM2.5) levels, socio-environmental factors (including household wealth, housing quality measures, smoking status), and the occurrence of respiratory illness in Indian children. The authors analysed data from India's National Family Health Survey combined with NASA's Global Annual PM2.5 Grids database. They examine associations between key social-environmental factors and respiratory illness in children younger than 5 years. The results showed extremely high annual PM2-5 levels throughout India, with higher exposure for rural and impoverished families. The study highlights the significant association of social-environmental conditions with health outcomes among young children in India.

The Lancet Regional Health – Southeast Asia

Chemicals

Associations of Organophosphate Ester Flame Retardant Exposures during Pregnancy with Gestational Duration and Fetal Growth: The Environmental influences on Child Health Outcomes (ECHO) Program

Widespread exposure to organophosphate ester (OPE) flame retardants with potential reproductive toxicity raises concern regarding the impacts of gestational exposure on birth outcomes. The authors analysed associations between gestational OPE exposures and adverse birth outcomes and tested whether associations were modified by sex. They included 6,646 pregnant participants from the Environmental influences on Child Health Outcomes (ECHO) Program. Three OPE were associated with higher odds of preterm birth. They observed effect modification by sex for associations of DPHP and potential dramatic spike in deaths among children in severely overcrowded and unsanitary displacement sites, where the spread of disease poses particularly lethal risks for children suffering from SAM, who are up to 10 times more likely to succumb to disease than a healthy child.

UNICEF (08/02/2024)

US companies DuPont and Chemours generated extensive contamination with toxic “forever chemicals” in North Carolina: UN experts

American chemical companies DuPont and Chemours have discharged toxic per- and polyfluoroalkyl substances (PFAS) into the local environment, completely disregarding the rights and wellbeing of residents along the lower Cape Fear River in North Carolina, UN experts* said today. Members of communities have reportedly been denied access to clean and safe water for decades. “Even as DuPont and Chemours had information about the toxic impacts of PFAS on human health and drinking water, the companies continued to produce and discharge PFAS,” the experts said. PFAS are a class of toxic chemicals also known as forever chemicals because they are highly persistent, meaning that they do not easily degrade in nature and can cause harm for decades, even centuries. The UN experts expressed alarm at the exports of PFAS-hazardous waste from The Netherlands to the United States, in apparent breach of international law.

UN (21/02/2024)

In the Media

'Deadliest outbreak ever seen': climate crisis fuels Bangladesh's worst dengue epidemic

Bangladesh is suffering from the spread of a mosquito-borne disease once largely limited to as higher rainfall and heat leads to a fivefold rise in cases in a year, with children the hardest hit. Government analysts have been busy collecting and monitoring the impact of Dengue across the country since cases were first reported last April. In 2023, the total reported cases of dengue numbered 321,179, with 1,705 deaths recorded, a massive jump from the year before, when 62,000 people were known to have had the virus, and 281 died. It was the highest number of annual deaths caused by the mosquito-transmitted disease ever recorded in Bangladesh. The deaths last year included at least 113 children. Dengue cases have risen dramatically around the world, with 70% of them occurring in Asia. Globally, the
high bis(2-chloroethyl) phosphate, with adverse associations among females.

**Environmental Health Perspectives**

**Child exposure to organophosphate and pyrethroid insecticides measured in urine, wristbands, and household dust and its implications for child health in South Africa: A panel study**

Children in agricultural areas are exposed to organophosphate (OP) and pyrethroid (PYR) insecticides. This study investigated child exposure to OPs and PYRs, comparing temporal and spatial exposure variability using urine, wristbands, and dust samples. During spraying season 2018, 38 South African children in two agricultural areas (Grabouw/Hex River Valley) and settings (farm/village) participated in a seven-day study. Child urine and household dust samples were collected on days 1 and 7. Children and their guardians wore silicone wristbands for seven days. Levels of chlorpyrifos in dust and diethylphosphate biomarker in urine showed strong and moderate temporal agreement between day 1 and day 7, respectively. No differences in exposure levels between living locations were observed. However, 21% of the urine biomarker levels exceeded the health-risk threshold for OP exposure. The high short-term variability in exposure levels during spraying season highlights the need for repeated sampling.

**Environmental Epidemiology**

**Prenatal exposure to pesticide mixture in Argentina: A pilot study in puerperal women from Santa Fe province**

This study aimed to determine the presence of environmental xenobiotics and evaluate their genotoxic effect, in mothers of newborns with and without congenital abnormalities (CA), and the possible association/correlation between those biomarkers and CA. A descriptive case and control cross-sectional study was developed on postpartum women from Santa Fe, Argentina. Metabolites of organochlorine (OC), organophosphate (OP), and pyrethroid (PYR) pesticides were detected. The most frequently detected compounds were atrazine (ATZ) (57.14%), carbanzimid (CBZ) (46.42%), and methylparaben (46.42%). A positive correlation was found between the number of pesticides in blood and genotoxic variables. Mothers of children with genitourinary anomalies had the highest concentrations of ATZ and OP. These

World Health Organization (WHO) estimates that 3.9 billion people – or half of the world’s population – are at risk of infection. The increasing frequency of extreme weather events is fuelling the spread of the disease into new locations and extending dengue seasons in countries where the disease is already present. The Guardian (18/01/2024)

**Philippines Floods Displace 100k Families, Child Welfare at Risk**

Torrential rains have battered Davao de Oro province in Mindanao region in the south of the Philippines in recent weeks, triggering deadly floods and landslides. Rescue efforts in parts of the region were also set back by a subsequent 5.2 magnitude earthquake. Mindanao is home to the second-largest island in the Philippines and a third of the country’s poorest people, which exacerbates the effects of natural disasters. The latest extreme weather has been partly brought on by the climate crisis. Save the Children Philippines sent teams over the weekend to hand out children’s hygiene kits and other supplies, as well as to assess other needs in landslide-affected areas that have impacted more than 1.2 million people, including about 269,000 children, and left at least 54 people dead. The Mirage (14/02/2024)

**Fast food packaging especially harmful for pregnant women, study warns**

Researchers from the University of Washington are suggesting that pregnant women should avoid fast food because of the packing. The team reports that phthalates, a class of chemicals associated with plastics, can actually seep out of food wrappings, packaging, and even the plastic gloves worn by store handlers. Even worse, over the course of the study, the consumption of fast food and ultra-processed foods showed an association with higher levels of phthalates among pregnant women specifically. When consumed by a pregnant woman, those chemicals can enter the bloodstream, pass through the placenta, and enter the fetal bloodstream. Prior studies have found that exposure to phthalates during pregnancy can increase the risk of low birth weight and preterm birth, as well as child mental health disorders like autism and ADHD. Study Finds (08/02/2024)
findings could greatly impact the health of future adults, who have been born preterm.

*Birth Defects Research*

**Metals**

*Prenatal metal exposures and childhood gut microbial signatures are associated with depression score in late childhood*

Childhood depression is a major public health issue worldwide. This study investigates whether children with specific combinations of prenatal metals and childhood microbial signatures (cliques or groups of metals and microbes) were more likely to have higher depression scores at 9–11 years of age. They used data from a pediatric longitudinal birth cohort in Mexico City and its microbiome substudy (n = 112). Eleven metal exposures were measured in maternal whole blood samples in the second and third trimesters of pregnancy. The authors identified a subgroup of children (11.6 % of the sample) characterized by a four-component metal-microbial clique that had a significantly high depression score (15.4 % higher than the rest) in late childhood.

*Science of the Total Environment*

**Reproductive Health**

*Maternal greenness exposure and preterm birth in Brazil: A nationwide birth cohort study*

This study investigates the relationship between maternal greenness exposure and preterm births in Brazil using data spanning from 2010 to 2019. Prevalence of preterm birth was 11.5%, with a modest but statistically significant decreasing trend observed across the nation over the study period. The findings reveal a significant association between greenness exposure and a reduced risk of preterm birth. Stratified analyses based on maternal education and ethnicity indicated potential effect modifications, with stronger protective effects observed among younger mothers and those with less years of education. This study suggests that higher maternal greenness exposure is linked to a decreased risk of preterm birth in Brazil.

*Environmental Pollution*

**The impact of air pollutants on spontaneous abortion: a case–control study in Tongchuan City**

The authors investigated air pollutants and spontaneous abortion in urban northwestern China. Data were collected from pregnant women

*Biden Administration to Tighten Air Pollution Standards*

The U.S. Environmental Protection Agency has announced that it is cracking down on air pollution. Specifically, the agency introduced a tougher air quality standard that takes aim at fine particulate matter -- the tiny bits of pollution that can penetrate the lungs -- by lowering the allowable annual concentration of the deadly pollutant that each state can have. “This final air quality standard will save lives and make all people healthier, especially within America’s most vulnerable and overburdened communities,” EPA Administrator Michael Regan said in an agency news release announcing the change. “Cleaner air means that our children have brighter futures, and people can live more productive and active lives...”.

Health Day (09/02/2024)

**Gas Stove Are Here to Stay, but Are They Safe? Here's What You Need to Know**

The US Department of Energy announced new energy-efficiency guidelines for gas and electric stoves that "make modest improvements." The new measures address the environmental impact of natural gas stove use, but do nothing to address the growing concerns over potential health risks. While more research is needed, recent studies have shown that natural gas stoves leak more than was previously known and pose a bigger long-term health threat, particularly to the respiratory health of children. As many as 40% of stoves in the US run on natural gas. In its unburned state, natural gas contains harmful air toxins, including benzene, a chemical linked to cancer, and methane, which is harmful to the environment. If you choose to have a gas stove, it is important to take steps to protect your family’s health, including running the exhaust fan, making sure your kitchen is well ventilated, getting your stove checked for leaks, and never letting the burner run without igniting it.

CNET (02/02/2024)

**Air Pollution Threatens Millions of Lives. Now the Sources Are Shifting**

As EPA tightens air pollution standards for particulate matter, new research suggests some components of that pollution could worsen with climate change. In July 2022, teams of scientists conducted an intensive campaign to characterize what’s in the summertime soup of particles that
in Tongchuan City from 2018 to 2019. A total of 289 cases of spontaneous abortion and 1156 cases of full-term labor were included. They found that O$_3$ is a risk factor for spontaneous abortion throughout pregnancy, while PM$_{2.5}$, PM$_{10}$, SO$_2$, and NO$_2$ are risk factors for spontaneous abortion in the 30 days before the last menstrual period. PM$_{2.5}$, PM$_{10}$, SO$_2$, and NO$_2$ are risk factors for spontaneous abortion in the 30–60 days before the last menstrual period. PM$_{2.5}$, PM$_{10}$, SO$_2$, and NO$_2$ are risk factors for spontaneous abortion in the 60–90 days before the last menstrual period. These findings present concerns for women in urban northwestern China and with similar exposures.

**Public Health**

The Association between Long-Term DDT or DDE Exposures and an Altered Sperm Epigenome—a Cross-Sectional Study of Greenlandic Inuit and South African VhaVenda Men

The organochlorine dichlorodiphenyl-trichloroethane (DDT) is banned worldwide owing to its negative health effects. DDT’s endocrine disrupting metabolite p,p’-dichloro -diphenyldichloroethylene (p’-DDE) exposures are linked to birth defects, infertility, cancer, and neurodevelopmental delays. The objective of this study was to assess the sperm epigenome in relation to p,p’-DDE serum levels between geographically diverse populations. The authors recruited South African men and selected 50 paired blood serum and semen samples, and Greenlandic Inuit blood and semen paired samples were selected from the biobank of the INUENDO cohort. They assessed the sperm epigenome in relation to serum p,p’-DDE levels and identified genomic regions with altered DNA methylation. The findings suggest that DDT and p,p’-DDE exposure impacts the sperm epigenome in a dose–response-like manner and may negatively impact the health of future generations through epigenetic mechanisms.

**Environmental Health Perspectives**

Water, Sanitation and Hygiene

Flood exposure and pregnancy loss in 33 developing countries

Here, the authors evaluated the risk of pregnancy loss for women exposed to floods. They analyzed 90,465 individual pregnancy loss records from 33 developing countries, cross-referencing each with spatial-temporal flood databases. They found that gestational flood exposure is associated with New York City residents breathe. The team found that the PM$_{2.5}$ was 80 to 83 percent organic, or carbon-based—up from roughly 50 percent in 2001, according to the study. “Over the past 20 years, summertime particulate matter has shifted to organic aerosols due largely to the successful reductions of sulfate and other inorganic compounds,” says the study’s lead author. Roughly 76 percent of the total organic aerosols measured by the study in New York City were not directly emitted from a source but rather formed in the atmosphere. These so-called secondary organic aerosols are produced when gases, including volatile organic compounds (VOCs), oxidize in the atmosphere.

Scientific American (08/02/2024)

Snapshots: How the climate crisis is hurting people in Central America

As world leaders gathered in December in Dubai for the UN-led COP28 climate summit to seek solutions for a dangerously overheating planet, photojournalist Fritz Pinnow embarked on a road trip to explore the complex climate dynamics in Central America. In a couple short months, he has observed the spread of arbovirus, extreme weather (storms and floods) forcing families to migrate from their rooms, and drought and flood causing food shortages. He continues on his journey to report to the world.

The New Humanitarian (13/02/2024)

Thirdhand Smoke: A Silent Threat to Children’s Health

While the dangers of smoking and secondhand smoke are well-known, researchers are shedding light on the equally harmful, but often overlooked issue of thirdhand smoke. Thirdhand smoke refers to the toxic tobacco residue that lingers on surfaces long after a cigarette has been extinguished. Particularly alarming is the impact of thirdhand smoke on children and pets, which are often the most vulnerable members of a household. This residue can stick to furniture, carpets, clothing, and even the skin, posing a threat to those who come into contact with these surfaces. Recent research detected the presence of nicotine and a tobacco-specific carcinogen, on surfaces in all of the tested children’s homes. This finding underscores the fact that home smoking bans do not fully protect children from the dangers of tobacco. Toxins can be easily ingested or inhaled by children, who frequently touch various surfaces and often put their hands in their mouths.
increased pregnancy loss. This risk is pronounced for women outside the peak reproductive age range (<21 or >35) or during the mid and late-stage of pregnancy. The risk escalated for women dependent on surface water, with lower income or education levels. They estimated that, over the 2010s, gestational flood events might be responsible for approximately 107,888 excess pregnancy losses annually across 33 developing countries. Notably, there is a consistent upward trend in annual excess pregnancy losses from 2010 to 2020. These findings underscore the disparities in maternal and child health aggravated by flood events in an evolving climate.

*Nature Communications*

**Climate Change**

*How climate change degrades child health: A systematic review and meta-analysis*

Children are more vulnerable than adults to climate-related health threats. This is the first systematic review and meta-analysis that identifies which climate-health relationships pose the greatest threats to children. We identified many relationships between climate change and child health, the strongest of which was increasing risk of preterm birth from exposure to temperature extremes. Respiratory disease, mortality, and morbidity, among others, were also influenced by climate changes. The following factors were protective of climate-related child-health threats: (i) economic stability and strength, (ii) access to quality healthcare, (iii) adequate infrastructure, and (iv) food security. Children will have increased prevalence of disease due to anthropogenic climate change, and our quantification of the impact of various aspects of climate change on child health can contribute to the planning of mitigation that will improve the health of current and future generations.

*Science of the Total Environment*

**EVENTS**

*Second Global Conference on Air Pollution and Health*

28 October – 1 November 2024

Accra, Ghana

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**Webinars**

*Boston Children’s Hospital - Healthy Homes Grand Rounds*

Date/time: Tuesday, March 19, 2024, 12:00 PM - 1:00 PM (EST), via Zoom

The Pediatric Environmental Health Center at Boston Children’s Hospital and the New England Region Pediatric Environmental Health Specialty Unit (PEHSU) welcome health professionals to attend the monthly virtual Pediatric Environmental Health (PEH) Grand Rounds. This Grand Rounds series will provide healthcare providers with state-of-the-science content on current topics in pediatric environmental health. Such information enable practitioners to effectively counsel families whose children face possible health issues due to environmental chemicals, toxins, and other insults. The PEH Grand Rounds will also educate on practice strategies for the biomonitoring of children at risk for specific exposures to environmental pollutants.

Boston Children’s Hospital/New England Region Pediatric Environmental Health Specialty Unit (PEHSU) (02/2024)

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**Medriva (08/01/2024)**

*Pregnant women in Indiana show fourfold increase in toxic weedkiller in urine – study*

Pregnant women in a key US farm state are showing increasing amounts of a toxic weedkiller in their urine, according to a new study. The research led by the Indiana University school of medicine, showed that 70% of pregnant women tested in Indiana between 2020 and 2022 had a herbicide called dicamba in their urine, up from 28% from a similar analysis for the period 2010-12. Notably, the study also found that the concentrations of the weed-killing chemical increased more than fourfold. The findings add to a growing body of literature documenting human exposure to chemicals used in agriculture. Many scientists have concerns about how farm chemicals affect pregnant women and their children, but say more research – and more regulatory scrutiny – is needed.

The Guardian (16/02/2024)

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**Have news for us?**

If you would like to submit information to future HECANET issues, email us at heca@who.int with the subject line "INFORMATION FOR HECANET".

Collated and distributed with the cooperation of the Children’s Environmental Health Clinic, University of Alberta, Canada