RADIATION: EFFECTS AND SOURCES

Today we know more about the sources and effects of exposure to radiation than to almost any other hazardous agent, and the scientific community is constantly updating and analysing its knowledge. Most people are aware of the use of radiation in the nuclear power production of electricity or in medical applications. Yet, many other uses of nuclear technologies in industry, agriculture, construction, research and other areas are hardly known at all. To someone who is reading about the topic for the first time, it may come as a surprise that the sources of radiation causing the greatest exposure of the general public are not necessarily those that attract the most attention. In fact, the greatest exposure is caused by natural sources ever present in the environment, and the major contributor to exposure from artificial sources is the use of radiation in medicine worldwide. Moreover, everyday experience such as air travel and living in well-insulated homes in certain parts of the world can substantially increase exposure to radiation. This publication is an attempt by the United Nations Environment Programme (UNEP) and the secretariat of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) to help raise awareness and deepen understanding on the sources, levels and effects of exposure to ionizing radiation.

Full publication

WHO CHILDREN’S ENVIRONMENTAL HEALTH TRAINING MODULES AVAILABLE IN PORTUGUESE

The WHO children's environmental health training modules for health care providers are now available in Portuguese. To register to access the PowerPoint versions of training modules please complete the registration form. Through these

CHILDREN’S ENVIRONMENTAL HEALTH NEWS

Press Releases

Survey on “From science to action” for the Basel, Rotterdam and Stockholm (BRS) conventions

The conferences of the Parties to the Basel, Rotterdam and Stockholm conventions, at their meetings in 2015, adopted decisions BC-12/22, RC-7/12 and SC-7/30 entitled “From science to action” by which they recognized the importance of the science-policy interface for the effectiveness of the conventions; stressed the need for scientific underpinning for decision-making and policy-making in the sound management of hazardous chemicals and wastes at the national and regional levels; and recognized the need for greater access to scientific understanding in developing countries to enhance informed decision-making on the implementation of the conventions. This survey is to collect information on the challenges and opportunities of parties and stakeholders of the BRS conventions in bringing science and policy together, which will be used in the development of a road map for further engaging parties and other stakeholders in informed dialogue.

Basel, Rotterdam and Stockholm Conventions Secretariat

Ending Grave Human Rights Violations of Children Demands Ending Conflicts, Establishing Peace, Secretary-General Tells Security Council

The global security landscape continues to change dramatically – but one grim reality does not: children still pay the highest price in wartime. Young boys and girls are directly targeted – and conscripted. They are tortured, maimed, imprisoned, starved, sexually abused and killed. Their homes and schools destroyed. In places such as Iraq, Nigeria, Somalia, South Sudan, Syria and Yemen, children suffer through a living hell. And in many cases, it is getting even worse. The ultimate
versions of the training modules, presenters and trainers have the flexibility of selecting the most relevant slides and adapting them to local situations and needs as well as target the audience of each particular training event.

Training modules in Portuguese and English

JOURNAL ARTICLES

Air Pollution

Air toxics and early childhood acute lymphocytic leukemia in Texas, a population based case control study
Traffic exhaust, refineries and industrial facilities are major sources of air toxics identified by the U.S. Environmental Protection Agency (U.S. EPA) for their potential risk to human health. In utero and early life exposures to air toxics such as benzene and 1,3-butadiene, which are known leukemogens in adults, may play an etiologic role in childhood leukemia that comprises the majority of paediatric cancers. A positive association was found between 1,3-butadiene and childhood leukemia in single and co-pollutant models whereas effect estimates from single pollutant models were diminished for benzene and POM in co-pollutant models. Early life exposure to 1,3-butadiene rather than benzene or POM appears to increase early childhood risk of acute lymphocytic leukemia.

Environmental Health Journal

Chemicals

E-cigarettes, Cigarettes, and the Prevalence of Adolescent Tobacco Use
Adolescent e-cigarette use has increased rapidly in recent years, but it is unclear whether e-cigarettes are merely substituting for cigarettes or whether e-cigarettes are being used by those who would not otherwise have smoked. To understand the role of e-cigarettes in overall tobacco product use, this study examined prevalence rates from Southern California adolescents over 2 decades. It was found that smoking prevalence among Southern California adolescents declined over 2 decades, but the high prevalence of combined e-cigarette or cigarette use in 2014, compared with historical Southern California smoking prevalence, suggests that e-cigarettes are not merely substituting for cigarettes and indicates that e-cigarette use is occurring in adolescents who would not otherwise has used tobacco products.

Pediatrics

WHO marks World Breastfeeding Week, calls for the right of all women to breastfeeding anytime, anywhere
On World Breastfeeding Week which is celebrated from 1 to 7 August, the World Health Organization in the Western Pacific recognizes the right of all women to breastfeed their children and advocates for women to be able to breastfeed whenever and wherever it is necessary. The theme “supporting moms to breastfeed anytime, anywhere” calls for a shift in attitudes to build breastfeeding-friendly societies in order to optimize the development, health and well-being of future generations. WHO WPRO (1/8/2016)

WHO and Ministry of Health expand cholera response to minimize future risk
In a move to prevent a cholera outbreak from spreading, the Ministry of Health of South Sudan with support from the World Health Organisation and other health partners are ramping up disease surveillance and treatment efforts. Across the country, 271 cholera cases have been reported, including 14 deaths since 12 July 2016. An oral cholera vaccination campaign set to start end of July aims to reach over 14,000 people. WHO (25/7/2016)

The Collegium Ramazzini releases its 19th Statement: A New Approach to the Control of Chronic Obstructive Pulmonary Disease (COPD)
COPD is a major and growing disease world-wide that is not well-recognised and is thus under-diagnosed. It is caused by exposures to a multitude of vapors, gasses, dusts and fumes known collectively as VGDF. The Collegium Ramazzini calls on the international community of occupational and environmental safety and health professionals to adopt a new paradigm towards the recognition and prevention of occupational and non-occupational exposures to VGDFs that cause COPD. Collegium Ramazzini (19/7/2016)

WHO Fact Sheets

Immunisation coverage Updated July 2016
Dengue and severe dengue Updated July 2016
Trachoma Updated July 2016

goal is to end these grave violations of the human rights of children. That demands ending conflicts and establishing peace. UN (2/8/2016)
The Genetic Basis for Variation in Sensitivity to Lead Toxicity in Drosophila melanogaster

Lead toxicity presents a worldwide health problem, especially due to its adverse effects on cognitive development in children. However, identifying genes that give rise to individual variation in susceptibility to lead toxicity is challenging in human populations. This study used Drosophila melanogaster to identify evolutionary conserved candidate genes associated with individual variation in susceptibility to lead exposure. It was found that substantial heritabilities for traits tested and identified candidate genes associated with variation in susceptibility to lead exposure for each phenotype.

Environmental Health Perspectives

Reproductive Health

Sperm Aneuploidy in Faroese Men with Lifetime Exposure to Dichlorodiphenyl dichloroethylene (p,p'-DDE) and Polychlorinated Biphenyl (PCB) Pollutants

Although it is known that sperm aneuploidy contributes to early pregnancy losses and congenital abnormalities, the causes are unknown and environmental contaminants are suspected. The goal of this study was to evaluate associations between lifetime exposure to organochlorines, specifically DDE and PCBs, and sperm aneuploidy in men from the general population of the Faroe Islands, a population with a known history of organochlorine exposures. It was found that organochlorine exposures measured at age 14 and in adulthood were associated with sperm disomy in this sample of high-exposure men, suggesting that the impacts of persistent pollutants on testicular maturation and function require further investigation.

Environmental Health Perspectives

Early life events predict adult testicular function; data derived from the Western Australian (Raine) birth cohort

The impact of maternal health and early life events upon the subsequent growth and development of a child and its lifelong predisposition to disease is well established. Apart from exposure to maternal smoking leading to a reduction in semen parameters, and hormonal markers of testicular function in adulthood, early life influences upon testicular function in adulthood are poorly understood. This study found that exposures to maternal smoking and higher cord blood estrogens

CDC confirms children's blood-lead levels went up in Flint

Federal health investigators released a report Friday that reached the same conclusion a Flint, Michigan, areas doctor did nearly a year ago – that blood-lead levels among children jumped dramatically after the city switched water supplies – though they now say those numbers are dropping.

USA Today (24/6/2016)

Toxic firefighting foam stocks to be dumped as Queensland ban enacted

The Queensland Government is banning the future use of chemical firefighting foams that have contaminated land and ground water around the Oakey Army Aviation Centre, west of Brisbane. Environment Minister Steven Miles said “the Government will require that any existing stocks of foams containing PFOS and PFOA are withdrawn from service at commercial and industrial premises, and similar products phased out and replaced, as soon as practicable with more sustainable alternatives.” ABC News (8/7/2016)
at delivery were associated with a reduced sperm output in adulthood. Optimal adult testicular function depends on being born at or above average weight, and maintaining optimal growth and adiposity into adulthood.

Journal of Clinical Endocrinology and Metabolism

In Vitro Effects of the Endocrine Disruptor p,p'-DDT on Human Follitropin

P,p'-DDT is a persistent environmental endocrine disruptor. Several studies have shown an association between p,p'-DDT exposure and reproductive abnormalities. The aim of this study was to investigate the putative effects of p,p'-DDT on the human follitropin receptor (FSHR) function, using Chinese hamster ovary (CHO) cells stably expressing human FSHR to investigate the impact of p,p'-DDT on FSHR activity and its interaction with the receptor. It was found that DDT acted as a positive allosteric modulator of the FSHR in the experimental model. These findings suggest that G protein-coupled receptors are additional targets of endocrine disruptors.

Environmental Health Perspectives

Water, Sanitation and Hygiene

Thumb-Sucking, Nail-Biting, and Atopic Sensitization, Asthma, and Hay Fever

The hygiene hypothesis suggests that early-life exposure to microbial organisms reduces the risk of developing allergies. Thumb-sucking and nail-biting are common childhood habits that may increase microbial exposures. This study tested the hypothesis that children who suck their thumbs or bite their nails have a lower risk of developing atopy, asthma, and hay fever in a population-based birth cohort followed to adulthood. It was found that children who suck their thumbs or bite their nails are less likely to have atopic sensitization in childhood and adulthood.

Paediatrics

A Review of Health Risks and Pathways for Exposure to Wastewater Use in Agriculture

Wastewater is increasingly being used in the agricultural sector to cope with the depletion of freshwater resources as well as water stress linked to changing climate conditions. As wastewater irrigation expands, research focussing on the human health risks is critical because exposure to a range of contaminants must be weighed with the benefits to food security, nutrition and livelihoods. In order to provide a more comprehensive understanding of the health risks of wastewater

Child labour doubles in Iraq as violence, displacement hit incomes

More than half a million Iraqi children are estimated to be at work rather than at school as violence and displacement hurt the income of millions of families, according to the United Nations children’s agency UNICEF. The number of children currently working has doubled since 1990, the year when Iraq attacked Kuwait, setting off a chain of events that led to the 2003 U.S.-led invasion and the sectarian strife that continues to this day. Reuters (10/7/2016)

'There is no escape': Nairobi's air pollution sparks Africa health warning

Pollution in the Kenyan capital is ‘beyond imagination’. With Africa’s predicted rise in population – and a constant stream of dirty second-hand cars from Europe and Japan – this urban health crisis could kill 1.5 million within a generation. The Guardian (11/7/2016)

To stem obesity, start before birth

The overwhelming majority of babies are lean at birth, but by the time they reach kindergarten, many have acquired excess body fat that sets the stage for a lifelong weight problem. Recent studies indicate that the reason so many American children become overweight is far more complicated than consuming more calories than they burn, although this is certainly an important factor. Rather, preventing children from acquiring excess body fat may have to start even before their mothers become pregnant. New York Times (11/7/2016)

Skin cancer risk for freckly red-heads equivalent to 21 years in sun

Having genes that give you red hair, pale skin and freckles increases your risk of developing skin cancer as much as an extra 21 years’ exposure to the sun, researchers have found. The research shows the MC1R gene variation not only increased the number of spontaneous mutations caused by sunlight, but also raised the level of other mutations in the tumours. Reuters (12/7/2016)

Pregnant mom’s food choices tied to baby’s body composition

Pregnant women who eat more carbs and fatty foods may not necessarily give birth to heavier babies, but they may still have infants with more fat tissue, a U.S. study suggests. In particular, women who ate a lot of saturated fats – the kind in meat, dairy and eggs – had babies with more fat mass,
use in agriculture, future research should consider multiple exposure routes, long-term health implications, and increase the range of contaminants studies, particularly in regions heavily dependent on wastewater irrigation.

*Environmental Health Perspectives*

**E-waste**

Determinants of residents’ e-waste recycling behaviour intentions: Evidence from China

With the improvement of the world economy and the rapid development of its electrical industry, electrical and electronic products are continually upgraded, so that waste electrical and electronic equipment (WEEE, or e-waste) which endangers human health is increasing rapidly. China has made an enormous contribution to global e-waste production: in 2014, the amount of global e-waste hit record highs of 41.8 million tons and China ranked second in the world with six million tons of e-waste discarded. This research analyses the factors influencing residents’ e-waste recycling behaviour intentions and focuses on the effect of residents’ Perceptions of informal recycling on their recycling behaviour intentions. The results showed that the key influencing factors were: environmental awareness, attitude towards recycling, perceptions of informal recycling, income and costs or recycling, and norms and publicity has a positive impact on perceptions of informal recycling.

*Journal of Cleaner Production*

**New Publications**

Lasting Impact of an Ephemeral Organ: The Role of the Placenta in Fetal Programming

Fetal programming is one of the most rapidly expanding areas of biomedical research. Yet the mechanisms underlying this phenomenon have remained murky. Epigenetic alterations—changes that affect how genes are expressed but not the DNA itself—may underlie many of these processes. Researchers are now exploring DOHaD in relation to the structure, function, and epigenome of an often overlooked but essential organ—the placenta.

*Environmental Health Perspectives*

**UPCOMING EVENTS**

UNESCO-IHE Hazardous Waste Management short course 2016

1 – 11 September 2016

regardless of their pre-pregnancy weight. Reuters (14/7/2016)

**Air pollution causes wrinkles and premature ageing, new research shows**

Air pollution is prematurely aging the faces of city dwellers by accelerating wrinkles and age spots, according to emerging scientific research. The effects of toxic fumes on skin are being seen in both western cities, such as London and New York, as well as in more visibly polluted Asian cities and in some cases may be worsening skin conditions such as eczema and hives. The Guardian (15/7/2016)

**Spending time in bright sunshine shows signs of reducing myopia**

An investigation into the environmental causes of myopia in children found that spending more time in the sun resulted in a 23% reduction in myopia in a group of Chinese children who spent an additional 40 minutes more outside each day, according to Ian Morgan, one of the researchers involved in the study. Morgan’s theory, which is supported by some animal research, is that light in the eye hits a neurotransmitter called dopamine, which releases chemicals that prevent the growth of the eye that can lead to myopia. The Australian (18/7/2016)

**Shop-bought meals ‘healthier for infants than homemade ones’**

Meals which parents make at home for their baby or toddler are often less healthy and more likely to lead to their child gaining weight than shop-bought ones, a new study has found. Home-prepared dishes may be cheaper to put together but they usually contain more fat and are more energy-dense than health guidelines recommend. The Guardian (20/7/2016)

**Contamination of water pushes up costs, makes safe water scarcer: study**

Contamination as people and agriculture crowd around water sources has hiked the cost of water treatment by 50 percent in some major cities, making it harder to provide safe drinking water for a growing urban population. An expansion of agriculture in areas where cities get their water and growing numbers of people living around watersheds are largely responsible for the rising cost of water treatment. Reuters (25/7/2016)

**Raw eggs safe for pregnant women in UK, say food safety experts**
A report from the Advisory Committee on the Microbiological Safety of Food states there is "very low" risk of salmonella from UK eggs produced under the Lion code quality assurance scheme. It is now recommending that the Food Standards Agency (FSA) considers amending its advice on eating eggs for those "vulnerable" to infection. The Guardian (26/7/2016)

The Poisoning of Children Around the World
Since the disaster in Flint, Mich., it seems each day there is a new report of lead exposure being rediscovered in American cities, towns and schools. But look beyond the United States, and our well-established environmental and public health infrastructure, and you see an even grimmer picture. Severe, persistent lead poisoning is occurring throughout low- and middle-income countries on a massive scale. Our researchers estimate that approximately 26 million people are at risk for exposure to lead globally. Some of the adverse health impacts from lead include neurological damage, a decrease in IQ, anemia, increased blood pressure, chronic headaches and infertility. New York Times (5/8/2016)