TOXINS ON THE DEVELOPING
BRAIN

Little Things Matter: The Impact of Toxins on the Developing Brain

The primary purpose of this seven minute video, presented by Dr Bruce Lanphear, was to help people understand the population impact of exposures to environmental toxins. After studying the impact of toxins on children for many years researchers have reached the conclusion that “little things matter”.

This video begins by reporting the percentage of some individual compounds found in children using information from a national study in the US. Mercury is found in 89% of children and lead is found in all children. More than 80% of children have organophosphate pesticides in their bodies while 100% have PCBs, a group of persistent pollutants that was banned in the 1970s. One hundred percent of children have the flame retardant, PDBE, while 96% have bisphenol A (BPA) in their bodies. Children are exposed to many toxins and dozens of untested chemicals all the time.

Toxins can have a lifelong impact on the child and we know that extremely low levels of toxins impact brain development. The video looks at the body burden of the individual child one pollutant at a time. It notes that while the contribution of the individual compound may only appear to make a small contribution there are drugs presently on the market for children that are...
active at lower levels than toxins found in blood.

The video reports how the increase in a specific chemical in the blood of a pregnant mother may be reflected by a decrease in the child’s IQ. As the video’s primary purpose was to help people understand the population impact of exposures to environmental toxins the researchers developed public health iconography - clusters of human icons to represent “exposed” children and human icons gathered in a bell-shaped figure to illustrate the population impact of shifting IQ by 5 points. This makes the presentation very graphical and easy to follow. The video ends with a list of suggestions to help avoid exposure to toxins. Link to the video on youtube

“Little Things Matter: Shifting IQs down a notch”
See comments by Emily Marquez on the Pesticide Action Network (PAN) webpage. Link to PAN webpage

**JOURNAL ARTICLES**

**Air Pollution**

*Household Cooking with Solid Fuels Contributes to Ambient PM\(_{2.5}\)* Air Pollution and the Burden of Disease*
Approximately 2.8 billion people cook with solid fuels. Research has focused on the health impacts of indoor exposure to fine particulate pollution. Here, for the 2010 Global Burden of Disease project (GBD 2010), the authors evaluated the impact of household cooking with solid fuels on regional population-weighted ambient PM\(_{2.5}\) (particulate matter ≤ 2.5 μm) pollution (APM\(_{2.5}\)). They estimated the proportion and concentrations of APM\(_{2.5}\) attributable to household cooking with solid fuels (PM\(_{2.5}\)-cook) for the years 1990, 2005, and 2010 in 170 countries, and associated ill health. They found that PM\(_{2.5}\) emissions from household cooking

**Health partners unite to build stronger systems for health in Ebola-affected countries**
 Ministers of Health and Finance of Ebola-affected countries, international organizations and development partners assembled for a high-level meeting on how to strengthen systems of health in Ebola-affected countries and agreed on what needs to be done to rebuild and strengthen essential health services in these countries. WHO (12/12/14)

**UNEP Launches Wastewater Video in the Series Two Minutes on Oceans with Jim Toomey**
The United Nations Environment Programme Regional Office for North America, UNEP Division of Environmental Policy Implementation and nationally-syndicated cartoonist Jim Toomey announced the release of the video "Wastewater: A widespread threat and missed resource," which portrays the impacts of wastewater on coastal communities and ecosystems, and the benefits of improving its management. UNEP (9/12/14)

The economic and social benefits of mangroves - which are estimated to run into the hundreds of billions worldwide - remain largely untapped due to a lack of carbon finance mechanisms, appropriate policy interventions, and rapid mangrove deforestation, according to a new United Nations Environment Programme report. UNEP (9/12/14)

**Scale-up in effective malaria control dramatically reduces deaths**
The number people dying from malaria has fallen dramatically since 2000 and malaria cases are also steadily declining, according to the World malaria report 2014. Between 2000 and 2013, the malaria mortality rate decreased by 47% worldwide and by 54% in the WHO African Region - where about 90% of malaria deaths occur. WHO (9/12/14)
constitute an important portion of APM$_{2.5}$ concentrations in many places, including India and China. Efforts to improve ambient air quality will be hindered if household cooking conditions are not addressed.

*Environmental Health Perspectives*

**Risks and Benefits of Green Spaces for Children: A Cross-Sectional Study of Associations with Sedentary Behavior, Obesity, Asthma, and Allergy**

Green spaces have been associated with both health benefits and risks in children; however, available evidence simultaneously investigating these conflicting influences, especially in association with different types of greenness, is scarce. The authors aimed to simultaneously evaluate health benefits and risks associated with different types of greenness in children, in terms of sedentary behavior (represented by excessive screen time), obesity, current asthma, and allergic rhinoconjunctivitis. They observed two separable patterns of estimated health benefits and risks associated with different types of greenness.

*Environmental Health Perspectives*

**Chemicals**


Use of pyrethroid insecticides has increased dramatically over the past decade; however, data on their potential health effects, particularly on children, are limited. The authors examined the cross-sectional association between postnatal pyrethroid exposure and parental report of learning disability (LD) and attention deficit/hyperactivity disorder (ADHD) in children 6–15 years of age. They concluded that postnatal pyrethroid exposure was not associated with parental report of LD and/or ADHD. However, given the widespread and increasing use of pyrethroids, future research...

*China Renews Commitment Towards Achieving Eco-Civilization*

The core aim of eco-civilization is to balance the relationship between humanity and nature, which includes economic development, population, resources and the environment. UNEP (1/12/14)

**In the Media**

*Two studies find big jump in teen use of e-cigarettes*

Two new studies have found that far more kids are using electronic cigarettes than previously reported, raising fears that the products could hook another generation on nicotine even as cigarette use is falling. USA Today (15/12/14)

*What Is Tinsel Made Of, And How Has It Changed Over The Years?*

Tinsel—named from the Old French word estincele, for sparkle—was made with lead until the FDA outlawed the practice in 1972. Aluminum, sometimes combined with cellulose acetate, was also popular but flammable. Most tinsel nowadays is made with fairly ordinary plastics like PVC. Chemical and Engineering News (15/12/14)

*Better ways to feed ourselves*

It is imperative to continue to emphasise the study of science that can help us face the global challenges ahead, understand the underlying problems and seek solutions for improved agricultural practices that can promote sustainability for the future and safe crops for consumption. Petaling Java Star (14/12/14)

*Improve water and sanitation in clinics to reduce maternal deaths: research*

Boosting water and sanitation investments in hospitals and clinics in low income countries is essential to reduce maternal and newborn deaths, according to research published.

*NIH cancels massive U.S. children’s study*

Federal officials are pulling the plug on an
should evaluate exposures at current levels, particularly during critical windows of brain development.

*Environmental Health Perspectives*

**Persistent Associations between Maternal Prenatal Exposure to Phthalates on Child IQ at Age 7 Years**

Prior research reports inverse associations between maternal prenatal urinary phthalate metabolite concentrations and mental and motor development in preschoolers. No study evaluated whether these associations persist into school age. The authors measured prenatal urinary metabolites of di-n-butyl phthalate (DnBP), butylbenzyl phthalate (BBzP), di-isobutyl phthalate (DiBP), di-2-ethylhexyl phthalate and diethyl phthalate in late pregnancy. The Wechsler Intelligence Scale for Children, 4th edition was administered at child age 7 years and evaluates four areas of cognitive function associated with overall intelligence quotient (IQ). They concluded that maternal prenatal urinary metabolite concentrations measured in late pregnancy of DnBP and DiBP are associated with deficits in children's intellectual development at age 7 years. Because phthalate exposures are ubiquitous and concentrations seen here within the range previously observed among general populations, results are of public health significance.

*PLoS ONE*

**Reproductive Health**

*Evaluation of contaminated drinking water and preterm birth, small for gestational age, and birth weight at Marine Corps Base Camp Lejeune, North Carolina: a cross-sectional study*

Births during 1968-1985 at Camp Lejeune were exposed to drinking water contaminated with trichloroethylene (TCE), tetrachloroethylene (PCE), and benzene. The authors conducted a cross-sectional study to evaluate associations between residential prenatal exposure to contaminated drinking water at Camp Lejeune ambitious plan hatched 14 years ago to follow the health of 100,000 U.S. children from before birth to age 21. *Science* (13/12/14)

**Prenatal exposure to common chemicals linked to lower IQ in children**

Two chemicals found in a number of common consumer products may be damaging to fetal development and could even lower children's IQs, according to a new study by researchers at Columbia University's Mailman School of Public Health in New York City. 60 Minutes CBS News (11/12/14)

**Govt ignoring children with deformities**

In a clear case of ignorance and insensitivity of Punjab government, Teja Ruhela - a small village situated close to the Pakistan border - infamous for children being with deformities like cerebral palsy, visual and hearing impairment, among others does not have a single healthcare facility. *Times of India* (11/12/14)

**Could the Chemical BPA Raise Your Blood Pressure?**

Korean researchers have found another small piece of evidence that the chemical BPA might affect health — this time by temporarily raising people's blood pressure. *NBC News* (9/12/14)

**Unicef Calls 2014 One of Worst Years on Record for World’s Children**

The year 2014 has been one of the worst on record for the world’s children, the United Nations said on Monday in a report that chronicled a litany of war, violence, atrocities and disease, mostly in the Middle East and Africa. *The New York Times* (8/12/14)

**Air pollution 'causing deadly public health crisis'**

New schools, care homes and hospitals should be built far away from major roads because of the dangers of air pollution, a report by MPs says. The Environmental Audit Committee argues air pollution is a "public health crisis" causing nearly
and preterm birth, small for gestational age (SGA), term low birth weight (TLBW), and mean birth weight (MBW) deficit. Findings suggested associations between in utero exposures to TCE and SGA, TLBW and reduced MBW; benzene and TLBW; and PCE and preterm birth. *Environmental Health*

**Water and Sanitation**

*Neurobehavioral Function in School-Age Children Exposed to Manganese in Drinking Water*

Manganese neurotoxicity is well documented in individuals occupationally exposed to airborne particulates, but few data are available on risks from drinking-water exposure. The authors examined associations of exposure from concentrations of manganese in water and hair with memory, attention, motor function, and parent- and teacher-reported hyperactive behaviors. They concluded that exposure to manganese in water was associated with poorer neurobehavioral performances in children, even at low levels commonly encountered in North America. *Environmental Health Perspectives*

**Global Change**

*Dilemmas of evaluation: health research capacity initiatives*

Strengthening health research capacity in low- and middle-income countries is a recognized way to advance health and development. Numerous approaches to strengthening capacity exist at different levels, including training for individuals, improving research systems within institutions, and international collaborations among national health research agencies. Systematic evidence on the effectiveness of different approaches remains limited. The authors were interested in understanding different approaches to health research capacity strengthening and analysed evaluation reports of health interventions funded by ESSENCE members and other agencies. They concluded that funders and policy-makers as many deaths as smoking. BBC News Health (8/12/14)

**Frequent dumping of e-waste poses threat**

Since the government does not have a proper policy on e-waste management in place, such ‘electrical and electronic waste’ is being indiscriminately dumped in the country. Such practices would be disastrous for human health and the ecology, including aquatic lives, flora and fauna, experts on the subject have warned. Dhaka Independent (7/12/14)

**Study Links Fracking to Infertility, Miscarriages, Birth Defects**

A new study links shale oil and gas development to a host of developmental and reproductive health risks, and says the processes involved – including hydraulic fracturing, or fracking – pose a particularly potent threat to what researchers called “our most vulnerable population.” US News &World Report (6/12/14)

**High toxin levels in Townsville playgrounds alarms researchers**

Elevated levels of toxic lead, nickel and arsenic have been detected on children's play equipment in the north Queensland city of Townsville, according to experts. Australian ABC News (5/12/14)

**FDA changes labeling for drugs used during pregnancy, lactation**

The new rule creates three detailed subsections on the labels of these drugs entitled “Pregnancy”, “Lactation” and ”Females and Males of Reproductive Potential”. Reuters (4/12/14)

**Assessing the Impact of Aerial Pesticide Spraying: Mancozeb Exposures among Pregnant Women Living near Banana Plantations**

Mancozeb is sprayed on bananas to prevent black sigatoka, a fungal disease that impairs fruit ripening and reduces banana yields. Investigators now report that pregnant women living near
aiming to harmonize evaluation approaches for health research capacity strengthening initiatives must successfully manage underlying tensions to move forward. These include the degree of stakeholder participation, the right balance of quantitative and qualitative data, the promotion of learning while gathering information and an emphasis on long-term, as well as short-term, gains.

*Bulletin of the World Health Organization*

**UPCOMING EVENTS**

**CEHN 2015 Research Conference**
Children: Food and Environment
4-6 February 2015. Austin, Texas

**16th International Conference of the Pacific Basin Consortium for Environment and Health.**
10-13 August 2015. City of Depok, West Java.

banana plantations in Costa Rica have elevated urinary levels of ethylene thiourea (ETU), a metabolite of mancozeb. Animal studies show that ETU, at high concentrations, interferes with fetal brain cell development and disrupts thyroid function after chronic exposure to lower concentrations. Environmental Health Perspectives (3/12/14)

*Your Odds Of Surviving Cancer Depend Very Much On Where You Live*
There's sobering news from the largest cancer study ever published. It surveyed more than 27 million patients and reveals a huge gulf in cancer survival worldwide. National Public Radio (2/12/14)

*Student probes toxicity of fire-retardant materials in daycares*
A University of Saskatchewan toxicology student has analyzed dust from 20 daycares in the Saskatoon area to learn whether flame retardant chemicals in foam furniture and children's toys pose a health hazard. Saskatoon Star Phoenix (1/12/14)

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