

Dust storms and human health

On 16 October 2014, dust storms in the Free State extended as far as Gauteng. From a recent review article by Goudie (from the University of Oxford) in "Environmental International", it became clear that evidence is mounting on an association between dust storms and human health effects. Particulates during dust storms may reach concentrations exceeding 6 mg/m³ (6000 µg/m³) and particles are not too large to be inhaled. Saharan dust particles as small as one micrometre in diameter have been detected in The United States. In Australia, particulate matter with a diameter equal to or less than 10 micrometres (PM₁₀) reached concentrations exceeding 15 mg/m³ (15 000 µg/m³) during a dust storm. These inhalable particles may remain suspended in air for at least two weeks at a time. In addition, other anthropogenic pollutants may be adsorbed to the particles. Although the Sahara is globally the main source of dust (57.9%), Australia contributes 5.6% and southern Africa 3.4%. Particulate matter from wind-blown dust is thus already an issue, also in South Africa and there is an indication that the incidence of dust storms are increasing in certain parts of the world, although the Kalahari has shown fluctuations between 1980 and 2000. In Australia, a statistically significant association was found between dust events and asthma severity. They also found an increase in visits to the emergency departments of up to 39%, and a 15% increase in non-accidental mortality (lag time 3 days) after a dust event.

Reference

Goudie, AS. 2014. Desert dust and human health disorders. *Environ. Int.* 63:101-113. doi: 10.1016/j.envint.2013.10.011.

South African Weather Service. Dust storms are rare events in South Africa, one which travels more than 800 km across the country is even more uncommon. http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT_2358887.html

Environmental Health Perspectives focusses on Children's Health in 2014

An expanded children's health section of the latest *Environmental Health Perspectives* Volume 122 (Issue 10) features six research articles looking at child respiratory health.

Whyatt et al. suggested that prenatal exposure to butylbenzyl phthalate (BBzP) and di-*n*-butyl phthalate (DnBP) may increase the risk of asthma among inner-city children while Humblet et al. provided some evidence for associations between exposure

to perfluoroalkyl chemicals (PFCs) and asthma-related outcomes in children. A Korean team of researchers looked at environmental tobacco smoke exposure and children's intelligence at 8-11 years of age (Park *et al.*). Urine cotinine concentrations (a biological indicator of environmental tobacco smoke exposure) were inversely associated with children's verbal IQ scores before and after adjusting for maternal IQ. Then, two articles considered maternal health. In a first study of its kind (Pereira *et al.*), PM_{2.5} sources were analysed in relation to preterm birth using a matched analysis thereby addressing shortfalls, such as individual-level confounding, of previous studies. There was insufficient evidence to suggest that sources were statistically associated with preterm birth, but sufficient support for further research. Kahn et al. looked at environmental lead levels and maternal thyroid dysfunction and provided evidence that prolonged lead exposure may contribute to this outcome by stimulating autoimmunity to the thyroid gland. The CEHN article of the month for October 2014 considered the policy implications of the National Birth Defects Prevention Study key outcomes on maternal exposure to criteria air pollutants and congenital heart defects in offspring (Stingone *et al.*). Specifically, they recommended that pollution exposure should be limited during potential windows of susceptibility during pregnancy (especially during cardiac development).

References

Whyatt RM et al. (2014) Asthma in inner-city children at 5-11 years of age and prenatal exposure to phthalates: The Columbia Centre for Children's Environmental Health Cohort. *Env Health Perspectives*, 122(10):1141-1146.

Stingone JA et al. (2014) Maternal exposure to criteria pollutants and congenital heart defects in offspring: results from the National Birth Defects Prevention Study. *Environ Health Perspectives*, 122(10): pp-pp.

Pereira G et al. (2014) Sources of fine particulate matter and risk of preterm birth in Connecticut, 2000-2006: A longitudinal study. *Environ Health Perspectives*, 122(10): 1117-1122.

Park S et al. (2014) Environmental tobacco smoke exposure and children's intelligence at 8-11 years of age. *Environ Health Perspectives*, 122(10): 1123-1128.

Humblet et al. (2014) Perfluoroalkyl Chemicals and asthma among children 12-19 years of age: NHANES (1999-2008). *Environ Health Perspectives*, 122(10):1129-1133.

Kahn et al. (2014) Blood lead concentration and thyroid function during pregnancy: results from the Yugoslavia Prospective Study of environmental lead exposure. *Environ Health Perspectives*, 122(10): 1134-1140.