

The Geneva Declaration on E-waste and Children's Health, 2013

In June, 2013, the World Health Organization (WHO) convened a workshop of international scientists, policy experts, and United Nations representatives to discuss the challenges of exposure of children and vulnerable populations to the toxic substances resulting from improper management of waste from electronic and electrical equipment (e-waste). As scientists actively engaged in human and environmental health research we welcome the initiatives of WHO to encourage the protection of children's health worldwide. These activities of WHO are instrumental in reducing hazards to children's health.

Under the Basel Convention e-waste is classified as hazardous waste when it contains listed components that are hazardous to humans, animals, and the environment. Improper e-waste management practices result in exposure to components - including lead, chromium, cadmium, nickel, copper, and persistent toxic substances, for example PBDEs, PCBs, PCCD/Fs, and PFAS - that are known to be associated with adverse health effects. There is, however, a lack of knowledge of the extent of the toxicity of the mixtures of chemicals in e-waste. Vulnerable populations, in particular children and developing embryo/foetuses, are at a particular risk of both exposure and its negative health effects.

We wish to make the following points:

1. The global production of e-waste is steadily growing, as is the population exposed.
2. Evidence of associations between exposure to e-waste and adverse health effects are increasing. Associations have been reported between e-waste exposure and altered thyroid function, reduced lung function, negative birth outcomes, reduced childhood growth, mental health outcomes, cognitive development, cytotoxicity, and genotoxicity.
3. There is convincing evidence of short and long-term adverse health effects caused by exposure to individual substances contained in e-waste, as well as possible synergistic effects from mixtures of compounds. These include carcinogenic effects, endocrine disruption, neurodevelopmental anomalies, negative birth outcomes, abnormal reproductive development, intellectual impairment, attention deficits, and cancer. However, more knowledge is required on the toxicity of the mixtures of chemicals that result from poor management processes.
4. The risk of adverse health effects extends beyond occupationally exposed individuals. Through environmental transport (including the transfer to homes via work clothes), bioaccumulation, and the persistence of these compounds in the environment, humans at significant distances from e-waste recycling sites can also be dangerously exposed.
5. Vulnerable populations - in particular pregnant women, developing embryos/foetuses, and children - are at particular risk of health effects because of their greater sensitivity, unique routes of exposure, and sensitive windows of development.
6. In many countries e-waste related activities are not conducted to a standard acceptable to protect the health and safety of those exposed. We therefore urge the international community, UN agencies, national policy makers and regulatory authorities, industry, and non-governmental organizations to cooperatively develop and introduce

preventative and protective measures to limit adverse health effects from direct and indirect exposure to substances resulting from unsafe e-waste management practices.

We urge the producers and distributors of electronic and electrical products to take active roles in implementing design improvements to minimize the e-waste arising, reducing the hazardous materials and mitigating the health risks associated with its management. We also encourage consumers worldwide to contribute to the reduction of environmental and human exposure to e-waste-related contaminants by considering how their end-of-life equipment is safely recycled and e-waste generation is minimized through the life span of their electrical and electronic products where this has environmental benefits.

We contend that the present scientific information is sufficient to support our concern, although uncertainties in risk assessment related to e-waste activities remain. The need for additional evidence, if any, should not delay regulatory action, and commercial or political interests must not take precedence over the adverse health consequences associated with e-waste.

We further encourage the creation of innovative means of ensuring the safety of people involved in all stages of the lifecycle of electronic and electrical equipment. These measures should be focused on protection of vulnerable populations in developing countries and emerging economies.

Our position is based on scientific observations and research findings. Evidence will be laid out in more detail in a position paper. This statement expresses the views of the authors, listed below, and does not necessarily reflect the positions of the organizations that they work for.

Authors (in alphabetical order):

Graham Alabaster, *Geneva, Switzerland*; Kwadwo Ansong Asante, *Accra, Ghana*; Ake Bergman, *Stockholm, Sweden*; Linda Birnbaum, *Research Triangle Park, USA*; Marie Noel Brune-Drisse, *Geneva, Switzerland*; Irena Buka, *Edmonton, Canada*; David Carpenter, *Albany, USA*; Jack Caravanos, *New York, USA*; Aimin Chen, *Cincinnati, USA*; Lilian Corra, *Buenos Aires, Argentina*; Justine Davies, *London, UK*; Fernando Diaz-Barriga, *San Luis Potosi, Mexico*; John Duti, *Accra, Ghana*; Christin Duffert, *Geneva, Switzerland*; Brenda Eskenazi, *Berkley, USA*; Torsten Feldt, *Hamburg, Germany*; Diana Gagliardi, *Rome, Italy*; Fiona Goldizen, *Brisbane, Australia*; Michelle Heacock, *Research Triangle Park, USA*; Ivan Holoubeck, *Brno, Czech Republic*; Xia Huo, *Shantou, China*; Mostafa Kamel, *Giza, Egypt*; Ruediger Kuehr, *Bonn, Germany*; Amalia Laborde, *Montevideo, Uruguay*; Philip Landrigan, *New York, USA*; Jinhui Li, *Beijing, China*; Duncan McCann, *London, UK*; Federico Magalini, *Bonn, Germany*; Maria Neira, *Geneva, Switzerland*; Innocent Chidi Nnorom, *Uturu, Nigeria*; Antonio Pascale, *Montevideo, Uruguay*; Mathuros Ruchirawat, *Bangkok, Thailand*; Leith Sly, *Brisbane, Australia*; Peter Sly, *Brisbane, Australia*; William Suk, *Research Triangle Park, USA*; Martin van den Berg, *Utrecht, The Netherlands*; Eddy Zeng, *Guangzhou, China*.