



Waste incinerator health risks: no evidence for toxic metal build-up

Spanish medical and public health researchers have found no clear evidence for increased heavy metal levels in adults living near a recently-built urban solid waste incinerator over two years of operation. Concentrations of lead, chromium and mercury in blood and urine samples taken around the plant were not significantly higher than for populations who lived further away.

Heavy metals, such as lead, cadmium, chromium and mercury, are pollutants emitted by urban solid waste incinerators (SWIs), although emissions of lead and cadmium have fallen significantly in recent years. Heavy metals from waste are of increasing concern to the European Commission, which is pursuing attempts to reduce the metal content of consumer products¹ and has established maximum levels allowed for foodstuffs². The negative effects on human health caused by accumulations of heavy metals in the body include lung, kidney, blood and bone disease.

The study tested around 100 adults for these four metals, half lived within 2km of an urban solid waste incinerator (SWI) which began operating in Bilbao in 2005 in compliance with EU regulations. The remainder lived in either a control urban area of equivalent high traffic density 5km from the plant, or a small town 20km from the plant with low traffic density. The researchers adjusted their findings for the influence of other factors which may affect levels of heavy metals in the body, such as profession, body mass index; smoking, alcohol consumption, fish and local food consumption and the presence of dental fillings. Tests took place in 2006 and again in 2008.

Lead levels increased significantly in all populations, living near and far from the SWI, over the two years. Levels of lead were slightly higher for those living closer to the SWI, but the difference was not statistically significant. Various other studies on this topic have not found that levels of lead are higher in areas close to SWIs. There were also no significant differences in mercury levels between the areas.

Cadmium concentrations were significantly higher in populations living nearer the SWI, but levels did not increase over the two years. The study was not able to explain these figures. In contrast, chromium was significantly higher in more distant populations in 2006, although levels had dropped in 2008 to match those found in populations living close to the SWI.

The researchers say their findings reinforce the hypothesis that increased levels of heavy metals are not found in populations living close to SWIs. However, they suggest that longer than customary monitoring periods may be needed to be confident that significant increases in concentration do not occur.

Europe currently produces 3 billion tons of waste annually, with amounts expected to almost double between 1995 and 2020. A large part of this is incinerated (regulated in Europe by directive 2000/76/EC³, prescribing emissions limits and monitoring regimes). The Sixth Environment Action Plan 2002-2012 promotes waste prevention and recycling as key waste management strategies, but there is also concern that currently unregulated recycling of solid waste residues in construction may lead to leaching of heavy metals into the environment.

1. http://ec.europa.eu/environment/waste/studies/heavy_metals.htm
2. http://ec.europa.eu/food/food/chemicalsafety/contaminants/cadmium_en.htm
3. <http://ec.europa.eu/environment/air/pollutants/stationary/wid.htm>

Source: Begona Zubero, M., Aurrekoetxea, J.J., Ibarluzea, J.M., *et al.* (2010) Heavy metal levels (Pb, Cd, Cr and Hg) in the adult general population near an urban solid waste incinerator. *Science of the Total Environment*. (408):4468-4474.

Contact: txitea@gmail.com

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