



Incinerators and their Health Effects

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Incineration is a topical subject in Ireland as our government presses ahead with plans to build various incinerators around the Irish countryside to deal with our waste problem. History has demonstrated that it may take decades to identify the health effects of procedures that produce more chemicals into our environment. Time and again, early warning signs have often gone unheeded and proven to be far more important than we realized at the time. Aside from the well-known premature assurance given regarding the use of toxic pesticides such as DDT in the past, it was also unexpected to find that a major source of dioxin contamination of food supplies was due to the older generation of incinerators in the UK. For these reasons, the British Society for Ecological Medicine has recently published a report on the health effects of waste incinerators. They explain in their introduction that the purpose of their report is "to look at all the evidence and come to a balanced view about the future dangers that would be associated with the next generation of waste incinerators".

Incineration does not solve the problem of waste, it only reduces waste to approximately 30 - 50 % of the original compressed waste mass, and this is converted into an ash that contains some of the most toxic concentrations of substances, such as dioxins and heavy metals. The generation and safe disposal of this toxic waste is very problematic as pollutants from landfill sites have been known to seep out, polluting local water sources, and once they contaminate the water table, their removal is considered to be almost impossible. The EU Commission have stated that this may be one of the most important sources of dioxins in the future. Accidents are also a possibility when moving toxic ash on lengthy road journeys to special landfill sites.

Incinerators release hundreds of toxic chemicals into the atmosphere when the waste is burned. Little is known about the risks of many of these toxic chemicals, particularly when they are combined. The exact composition of the emissions from incinerators is variable depending upon the waste being burnt, the efficiency of the incinerator and the pollution control measure available. As the chemical nature of our waste is changing, the potential for adverse health effects from incineration emissions are very difficult to assess. In terms of health effects, some of the most important constituents of emissions are considered to be *particulates, heavy metals and combustion products of man-made chemicals*.

Particulates, or particulate matter (PM) is a complex mixture of organic and inorganic particles that can be solid, liquid or both, suspended in the air. There is a large, and increasing body of research highlighting the health dangers of particulates found in incinerator emissions. Research done in 2004 by the WHO European Centre for Environment and Health, Bonn found that:

- *PM increases the risk of respiratory death in infants under 1 year, affects the rate of lung function development, aggravates asthma and causes other respiratory symptoms such as cough and bronchitis in children;*
- *PM2.5 seriously affects health, increasing deaths from cardiovascular and respiratory diseases and lung cancer.*

Increased PM2.5 concentrations increase the risk of emergency hospital admissions for cardiovascular and respiratory causes; and

- *PM10 affects respiratory morbidity, as indicated by hospital admissions for respiratory illness (WHO fact sheet, 2005; 2).*

In terms of heavy metals, several of the metals found in the emissions and ash produced by incinerators are known or suspected carcinogens. These toxins accumulate in the body over time. In children they have been implicated in childhood problems including autism, dyslexia, allergies, impulsive behaviour attention deficit and hyperactivity disorder (ADHD) as well as learning difficulties, lowered intelligence and delinquency. Exposed adults have demonstrated higher levels of violence, dementia and depression than in non-exposed adults. They have also been implicated in Parkinson's disease. Inhalation of some of them, such as nickel, beryllium, chromium, cadmium and arsenic, is found to increase the risk of lung cancer. Mercury, one of the most dangerous heavy metals, is neurotoxic and implicated in learning disabilities, hyperactivity as well as Alzheimer's Disease.

The report also found that a large number of the toxins emitted by incinerators can cause damage to the immune system. It is now thought that the synergistic effect of the combination of various toxins is likely to have an even more potent and damaging effect on immunity than any pollutant in isolation. Most of these chemicals are fat-soluble and accumulate in the fatty organs and tissue. They are particularly dangerous to the unborn child because many of these toxins are actively transmitted to the foetus across the mother's placenta, for the body mistakes heavy metals for essential minerals. Until very late in the pregnancy, the only fatty tissues that the foetus has, is its nervous system and particularly the brain, so it is there that they accumulate.

The National Research Council was established to advise the US government on the extent of population that would be exposed to health hazards by an incinerator. They concluded that,

Persistent air pollutants, such as dioxins, furans and mercury can be dispersed over large regions – well beyond local areas and even the countries from which the sources emanate. Food contaminated by an incinerator facility might be consumed by local people close to the facility or far away from it. Thus, local deposition on food might result in some exposure of populations at great distances, due to transport of food to markets. However, distant populations are likely to be more exposed through long-range transport of pollutants and low-level widespread deposition on food crops at locations remote from an incineration facility (B.S.E.M.report,2005;34).

When looking at the updated incinerators that cause less air pollution, they found that they cause more toxic ash, which is easily wind-borne. It is of critical importance, that there is still no adequate method for disposing with this toxic fly ash and that it has a record of being poorly regulated.

The evaluated cost of incineration is enormous, not just in the waste disposal costs, which are very high, but also in health and environmental damage, which can cost countries billions to address. It was exactly for these types of situations that the Precautionary Principle was introduced into national and international law. A recent review of health effects of incinerators found a positive exposure-disease association with cancer and congenital malformations. It would therefore seem that from the evidence presented in this report, that building municipal waste incinerations not only contravenes the Precautionary Principle but possibly, European law.

Finally, the authors of the report note that,

Taking into account these results and the difficulty in identifying causes of cancers and other chronic diseases, it is a matter of considerable concern that incinerators have been introduced without a comprehensive system to study their health effects and that further incinerators are being planned without comprehensive monitoring either of emission or of the health of the local population. (B.S.E.M. report, 2005; 21)

As Professor C. V. Howard from the Centre for Molecular Biosciences, University of Ulster, concluded in his foreword on the report,

Incineration destroys accountability and this encourages industries to go on making products that lead to problematic toxic wastes. Once the waste has been reduced to ash who can say who made what? The past 150 years has seen a progressive "toxification" of the waste stream with heavy metals, radionuclides and synthetic halogenated organic molecules. It is time to start reversing that trend. We won't achieve that while we continue to incinerate waste.

Juliet Duff,
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References:

British Society for Ecological Medicine Report (2005) *The Health Effects of Waste Incinerators* can be downloaded from the website: www.ecomed.org.uk/pub_waste.php

WHO, EUROPE, fact sheet euro (04/2005) Berlin, Copenhagen, Rome, *Particulate matter air pollution: how it harms health*, can be downloaded on:
www.euro.who.int/document/mediacentre/fs0405e.pdf

See Also:

[IDEA Position on Incineration](#)

[Recycling of Household Waste: IDEA Submission to the Joint Oireactas Committee, Aug 2005](#)

[The Zero Waste Alliance website](#)