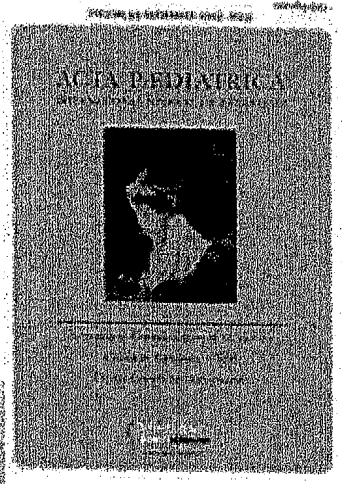




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Decreased lung function associated with perinatal exposure to Dutch background levels of dioxins

Acta Paediatrica 90(11): 1292 - 1298

ten Tusscher, et al.

Lung Function Assessment

41 healthy children (7–12 y, mean 8.2 y)

Prenatal exposure: 8.74 - 88.8 (mean 34.6) ng TEQ dioxin/kg fat, measured in breast milk

Postnatal exposure: 4.34 - 384.51 (mean 75.4) ng TEQ dioxin

Medical history of the children and their families

Spirometry



Lung Function Results

Decreasing lung function with increasing prenatal exposure ($p=0.045$)



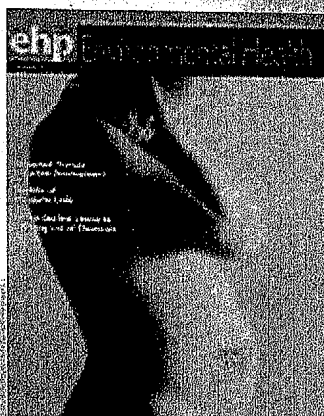
Decreasing lung function with increasing postnatal exposure ($p=0.0002$)



Increase in asthmatic complaints with increasing exposure ($n=4$)



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Persistent Hematologic and Immunologic Disturbances in 8-Year-Old Dutch Children Associated with Perinatal Dioxin Exposure

Environmental Health Perspectives 111 (12): 1519-1523

ten Tusscher et al.

Immune System Effects

Reduction in allergy with increasing prenatal ($p=0.023$) and postnatal ($p=0.030$) exposure

Increasing CD4⁺ (T-helper) cells with increasing postnatal exposure ($p=0.006$)

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Immune System Effects

Increase in autoimmune disease in rodents – humans?

Holladay. *Env Health Perspect* 1999; 107(5): 687-91

Allergic disease aggravation by enhancing IgE-response

Kimata. *Int J Hyg Environ Health* 2003; 206(6): 601-4

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Haematology Effects

Decreasing numbers of blood platelets with increasing postnatal exposure ($p=0.04$)

Platelet production problem

Stem cell damage?

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Behavioural Problems

Increase in social problems & aggression in two environments (home and school) with dioxins

ten Tusscher et al. Thesis 2002

In boys less masculine play, in girls more masculine play, with increasing prenatal PCBs

Vreugdenhil et al. Env Health Perspect 2002; 110(10): A593-8



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Brain Development

Ultra modern and sensitive testing (MEG)

Retardation in brain development of on average $3\frac{1}{2}$ y

Possible relation with behavioural problems



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Effects seen in adolescence and adulthood

Increased incidence of non-Hodgkin lymphoma (RR 2.3) in vicinity of municipal solid waste incinerator

Floret et al. Epidemiology 2003; 14(4): 392-8

Delay in genital and breast development in boys and girls with dioxins

Den Hond et al. Health Perspect 2002; 110: 771-6

Possibly increase in endometriosis with dioxins

De Felip et al. Toxicol Lett 2004; 150(2): 203-9

Adolescent colorectal cancer and dioxin?

Pratt et al. Lancet 1987; 2(8562): 803

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Accidents may be catastrophic

Often argued that risk of accident in incineration plant is small

The last years have shown numerous accidents at waste incinerators and by-product storage facilities, resulting in high local exposures

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A few examples of waste incinerator accidents

- 1994 Incinerator in Duiven exceeds dioxin emission norm – unclear why or how
- 1996 Fire in waste incinerator in Holland with high dioxin emissions
- 1997 Incinerator in Rotterdam exceeds dioxin emission norm
- 2001 Toxic cloud emission from incinerator
- 2002 Elbe floods its banks and storage depot for dioxins (by-products of incinerations)
- 2004 Dioxin emissions following faulty filters



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Four major dioxin/PCB disasters

60's – 70's Agent Orange, Vietnam

1968 Yusho, Japan

1976 Seveso, Italy

1978 Yucheng, Taiwan

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Vietnam

Agent Orange was dioxin contaminated defoliant used on large scale in South East Asia during Vietnam War

Data is beginning to emerge of large scale

- birth defects
- illnesses
- Cancers

These effects are also seen in second and even third generations!



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Yusho

1968 accidental PCB and PCDF contamination of rice oils in Japan

Exposed children were apathic and uninterested

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Seveso

- 1976 explosion at chemical plant
- Exposed parents gave birth to almost exclusively girls (possibly anti-oestrogenic effect)
- Increased liver enzyme concentrations (alanine aminotransferase, ALAT)



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Yucheng

1978 accidental PCB and PCDF contamination of rice oils in Taiwan

Children had hyperpigmentation, intra-uterine growth retardation, natal teeth, pigmented dysplasia of the nails, hirsutism, hypertelorism, conjunctivitis, clinodactyly, widely open fontanelles and spotty calcifications of the skull

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Yucheng

25% of the hyperpigmented babies died before their 4th birthday

Respiratory distress and pneumonias during the first 6 months of life was common amongst in utero exposed babies

Later effects in the survivors included reduced I.Q., musculoskeletal changes and shorter stature



Governing bodies

Who takes responsibility for the safeguarding of human (and environmental) health?

– EPA?

- Is the EPA willing to stand guarantee against human and environmental harm from the proposed Indaver plant?

– Department of Health?

- Will the Health Department guarantee stringent biomonitoring? Of which substances? Using which standards? Using which exposure limits?



WHO rules designed to protect population

WHO has rules for incinerator sites

The proposed Ringaskiddy site does not conform to numerous of these rules, for example:

- Too little distance from a captive population
- Too few access roads
- Emergency vehicles cannot reach the site within the designated timespan



Governing body recommendation

The EPA avoids taking responsibility for health risks, although they are the body needing to do so

The Health Department has no reliable baseline exposure data from the area, no sufficient biomonitoring system and insufficient training of health professionals in dealing with the possible dangers

The assessment of this hearing must then be a negative advice from the outset



Did anyone stop to think ...?

Why does Ireland actually want a (toxic) waste incinerator?

There are numerous incinerators throughout Europe capable of handling Ireland's wastes

These sites are already polluted

At a time when we are working towards more and more of a United Europe, it is unnecessary and short-sighted not to take advantage of the existing facilities

Why damage Ireland and her inhabitants when this is not necessary?



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A final study to illustrate the point ...

Childhood cancer/leukaemia births are associated with high atmospheric emissions from combustion processes

Knox EG. Childhood cancers and atmospheric carcinogens.
J Epidemiol Community Health 2005; 59: 101-5

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Summarising

Birth defects

Hormone disruption

Decreased lung function

Reduced production blood platelets

Immunity interference

Increased cancer risk

Influence on the thyroid

Liver damage

Dental problems

Behavioural problems

Retardation sexual development

Retardation in brain development

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Concluding

Our children are already being exposed to concentrations that are too high – don't increase it further!

Any increase in this exposure, for instance in the case of an accident, only increases the damage done to them

Dioxins and PCBs (POPs) remain in our bodies for many years

It is not wise to risk the health and development of our children

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Take home message ...

Why place your children at risk?

Why risk damaging your beautiful and clean Ireland?

Thank you for your attention!

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