

# Dioxin exposure and effects on children's health

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## Overview

Introduction

Background exposures

Accidents

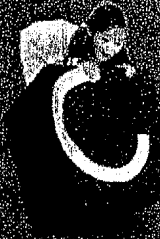
Governing bodies

Final thoughts

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Cork,  
18-02-2005





## Why dioxins?

Numerous chemicals potentially harmful, however ...

Dioxins are well studied

Much data available on health effects

Personal area of experience

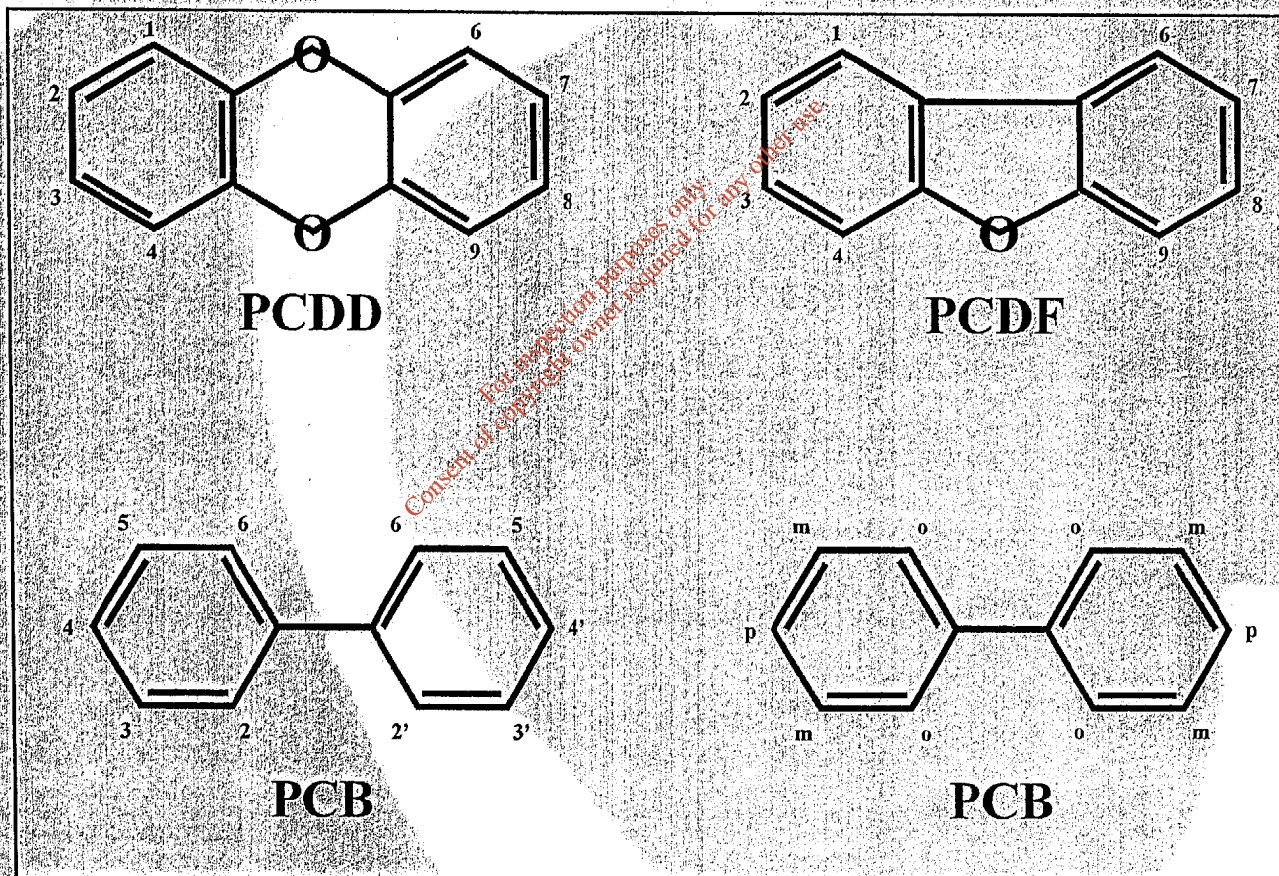
Dioxins are almost exclusively waste-products





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## What are Dioxins and PCBs?



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## Dioxins

- Are of the most toxic substances known
- Colourless crystals or solids in pure form
- Not intentionally produced except for small quantities for research
- Extremely difficult to break down (metabolise), thus accumulating, long half-life
- Stored in fat (adipose) tissue
- Exposure via placenta and breast milk
- Europe has high background exposure levels





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## What is background exposure?

Concentrations we are exposed to in our daily lives

WHO recommendations as a result of extreme toxicity and potential for enormous health effects

Ireland has relatively low levels, especially compared to many other European countries

What health effects of background exposures have been seen?





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## Birth Defects

Increase in infant deaths and infant deaths with congenital disorders near solid waste incinerator

*Tango et al. J Epidemiol 2004 May; 14(3): 83-93*

Increase in hypospadias, phimosis, cryptorchidism, SGA, spontaneous abortions in polluted part of Russia

*Revich et al. Gig Sanit 2002; (1): 8-13*

Increased miscarriages and premature birth; 60% congenital malformations after Agent Orange

*Le et al. Reprod Health Matters 2001; 9(18): 156-64*

Increase in orofacial clefts

*ten Tusscher et al. Chemosphere 2000; 40: 1263-70*

Other birth defects?





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## Zeeburg

1960s large scale incinerations of various chemicals in largely unknown quantities in open air

Seven-fold increase in cleft lips/palates



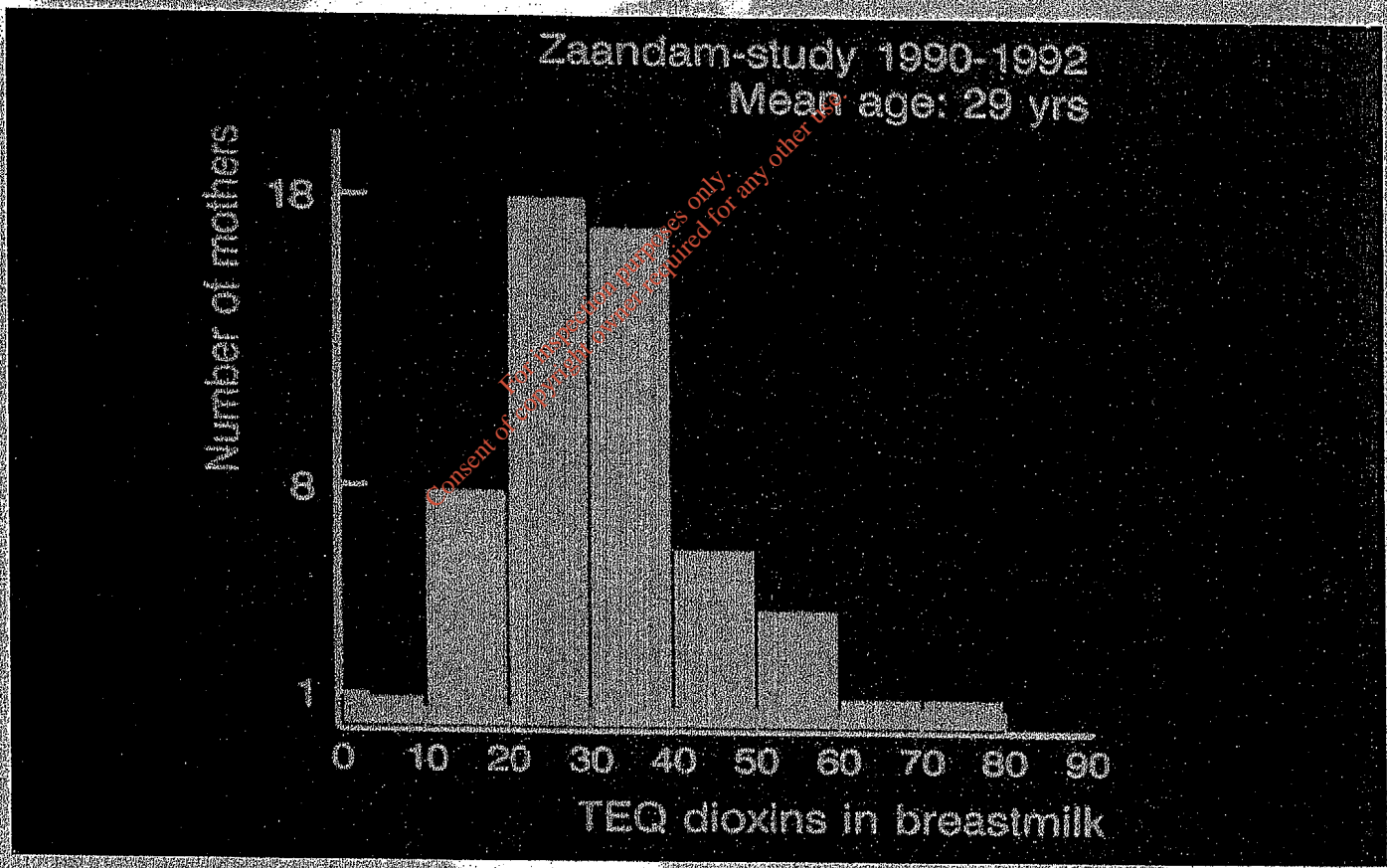
The present increasing incidence of hypospadias in Europe is being blamed on endocrine disrupting chemicals





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# Amsterdam/Zaandam Cohort



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## Effects seen in the Neonate

- Disregulation of thyroid function

*Pluim et al. Lancet 1992; 339: 1303. Environ Health Perspect 1993; 101(6): 504-8*

*Koopman-Esseboom et al. Pediatr Res 1994; 36(4): 468-73*

- Liver damage

*Pluim et al. Acta Paediatr 1994; 83(6): 583-7*

- Reduced platelet counts (necessary for coagulation)

*Pluim et al. Acta Paediatr 1994; 83(6): 583-7*

- Reduced numbers of immunity cells required for acute infections (granulocytes)

*Pluim et al. Acta Paediatr 1994; 83(6): 583-7*

*Weisglas-Kuperus et al. Pediatric Res 1995; 38(3): 404-10*

*Nagayama et al. Chemosphere 1998; 37(9-12): 1781-7*





## Effects seen in Toddlers and Pre-schoolers

Precocious neuromotor development

*Ilgen et al. Chemosphere 1996; 33(7): 1317-26*

Chickenpox at a younger age

*Weisglas-Kuperus et al. Environ Health Perspect 2000; 108(12): 1203-7*

More middle-ear infections

*Weisglas-Kuperus et al. Environ Health Perspect 2000; 108(12): 1203-7*

Less asthma

*Weisglas-Kuperus et al. Environ Health Perspect 2000; 108(12): 1203-7*





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## Effects seen in School Children

More dental defects (caries and enamel)

*Alaluusua et al. Eur J Oral Sci 1996; 104(5-6): 493-7*

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