β-HCH

Prospective (nested studies)
Blood measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Høyer et al. (2000b) Cancer Causes and Control, 11, 177-184 Nested case-control study	Denmark	155	274	Highest compared to lowest quartile			Age adjusted OR 1.2 (0.5-3.0) Weight adjusted OR 1.2 (0.5-3.0)	Age Adjusted for weight changes between two examinations	N.D. N.D.	Median serum levels (all subjects) 1976-1978 119.0ng/g lipid 1981-1983 60ng/g lipid		[More limited details of analysis compared to Hoyer *et al.* 2000a]
Ward *et al.* (2000) Cancer Epidemiology, Biomarkers & Prevention, 9, 1357-1367 Nested Hospital-based case-control study	Norway	150	150	Highest compared to lowest quartile	Odds ratios 0.7 (N.D.)	N.D.				Mean serum levels 60.0ng/g lipid	Mean serum levels 63.4ng/g lipid	
Dorgan et al (1999) Cancer causes and control 10, 1-11 Nested case-control study	USA	105	207	Highest compared to the lowest quartile			Relative Risk 0.7 (0.3-1.5)	Matched by age, benign breast disease diagnosis during prior 2 years, month and year of blood collection	0.93	Not reported	Not reported	
Hoyer *et al.* (1998) The Lancet 352, 1816-1820	Denmark	237	469	Highest compared to lowest quartile	1.36 (0.80-2.31)	0.21	1.36 (0.79-2.33)	Age, number of full term pregnancies and weight	0.24	Not reported		Study included large number (46 of statistical comparisons).

β-HCH

Retrospective (case-control studies)
Blood measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Lopez-Carillo *et al.* (2002) European J. Cancer Prevention, 11, 129-135 Hospital-based case-control study		95	95	Highest compared to lowest tertile			Age adjusted OR 1.45 (0.71-2.94) Multivariate adjusted OR 1.05 (0.46-2.40)	Age Age at menarche, number of children and age at first birth, lifetime lactation, family history of breast cancer, menopausal status, Quetelet Index	N.D. 0.8	Median levels (serum) 104.16ng/g lipid	Median levels (serum) 92.98ng/g lipid	

β-HCH

Retrospective (case-control studies)

Blood measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Demers *et al.*, (2000) Cancer Epidemiology, Biomarkers & Prevention, 9, 161-166 Hospital-based case-control study 315 cases,)	Canada	315	219 hospital controls (HC) 307 population controls (PC)	Upper compared to lowest quintile			Relative Risk (RR) Using HC **0.83 (0.43 - 1.61)** Using PC **0.80 (0.47 - 1.35)**	Age, region of residence, BMI, breast feeding duration, age at first child, number of fertile years, family history of breast cancer, history of benign breast cancer Age, region of residence	N.D.	Mean plasma levels 21.1µg/kg lipid	Mean plasma levels HC 19.4µg/kg lipid PC 17.5µg/kg lipid	High concentrations of β-HCH were not related to increased breast cancer risk, although high β-HCH levels were suggested to be associated with risk of large tumours. High β-HCH plasma levels associated with increased risk of large tumour (RR=2.25, 95% CI = 1.12-4.51) There was no evidence of an interaction between organochlorine exposure and hormonal status of the tumour

β-HCH

Retrospective (case-control) studies

Adipose measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Aronson *et al.* (2000) Cancer Epidemiology, Biomarkers & Prevention, 9, 55-63 Hospital-based case-control study.	Canada	217	213	Highest compared to lowest quartile			Multivariate Adjusted OR 0.69 (0.34-1.40)	Age, study site, menopausal status, present use of HRT, ethnicity, family history, BMI, fat intake, alcohol intake	N.D.	Geometric means 43.1µg/kg lipid	Geometric means 41.5µg/kg lipid	Increased risk in pre-menopausal women (adjusted OR = 1.52), but no measure of significance
Stellman *et al.* (2000) Cancer Epidemiology, Biomarkers & Prevention, 9, 1241-1249 Hospital-based case-control study	USA	232	323	Highest compared to lowest tertile			Odds ratios not reported. Authors state that no associations were found with breast cancer risk			Median levels 19.8ng/g	Median levels 15.8ng/g	
Guttes *et al.* (1998) Arch. Environ. Contam. Toxicol 35, 140-147	Germany	45 (breast cancer)	20 (benign breast cancer)							Age adjusted geometric mean 79µg/kg	Age adjusted geometric mean 93µg/kg	No determination of odds ratio. No significant difference between cases and controls (p=0.360)
Mussalo-Rauhamaa (1990) Cancer 66, 212402128	Finland	41	33							Mean level in adipose breast tissue 0.13mg/kg fat	Mean level in adipose breast tissue 0.08mg/kg fat	No statistical difference between cases and controls (P=0.026)

β-HCH

Hormone Receptor Status
Adipose measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Woolcott *et al.* (2001) Cancer Causes Control, 12, 395-404 Hospital-based case-control study	Canada	217	213	Highest compared to the lowest tertile			**Odds Ratios** ER+ 0.7 (0.4-1.3) 147 cases, 208 controls ER- 1.4 (0.6-3.2) 51 cases, 208 controls	Age, site, menopausal status, use of HRT, ethnicity, BMI, family history, intake of fat and alcohol		Geometric means (breast adipose tissue) (ER+) 54.9µg/kg lipid (ER-) 39.3µg/kg lipid	Geometric means (breast adipose tissue) 41.5µg/kg lipid (controls)	
Dewailly *et al.* (1994) **J. Natl. Cancer Inst. 86, 22-23**	Canada	9 ER+ 9 ER-	17							Mean levels (breast adipose tissue) (ER+) 39.7µg/kg (ER-) 34.7µg/kg	Mean levels (breast adipose tissue) 39.7µg/kg	Statisitical measurement of differences between cases and controls were 0.77 and 0.92 for ER+ and ER- respectively

β-HCH

Other studies

Blood measures

		Study design			Unadjusted results		Adjusted results			Blood levels		Comments
Study (reference)	**Country**	**No of Cases**	**No of Controls**	**Comparison for OR**	**OR/RR (95% CI)**	**Trend test (p)**	**OR/RR (95% CI)**	**Adjusted for**	**Trend test (p)**	**Mean DDE (cases)**	**Mean DDE (controls)**	
Høyer et al. (2000a) Journal of Clinical Epidemiology , 53, 323-330 Breast survival analysis (cohort of 7712 women)		Exams 1st 1976-1978 195 2nd 1981-1983 155					Relative Risk (RR) (65 cases, 65 controls) 1st 1.19 (0.7-2.02) 2nd 1.31 (0.61-2.83)	Age	N.D. 0.02	Mean serum levels 284.31ng/g lipid (1st) 271.21ng/g lipid (2nd)		No evidence that beta-HCH may be associated with breast cancer risk. [Analysis of dieldrin, beta-HCH, HCB, op DDT, op DDE, pp DDT, pp DDE, pp DDD and 27 PCB congeners + total PCB]