

Endocrine Disrupting Chemicals (EDCs) and Human Health

内分泌干扰物 and 人体健康

Hälsorisker med hormonstörande ämnen

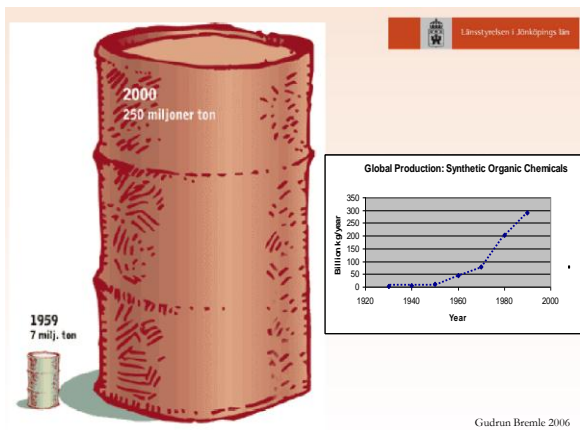
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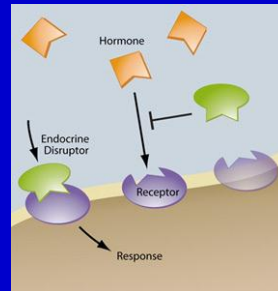
Frågeställningar

Varför bry sig om hormonstörande ämnen, eller vad är det som skiljer denna typ av kemikalier från alla 100 000 andra?

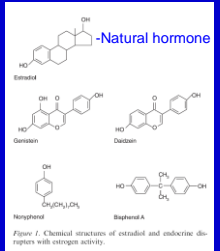
Hur mycket vetenskaplig evidens behöver vi ha innan vi ska agera?



Endocrine Disrupting Chemicals (EDCs)



Environmental Estrogens!



Four reasons for emerging public health concern

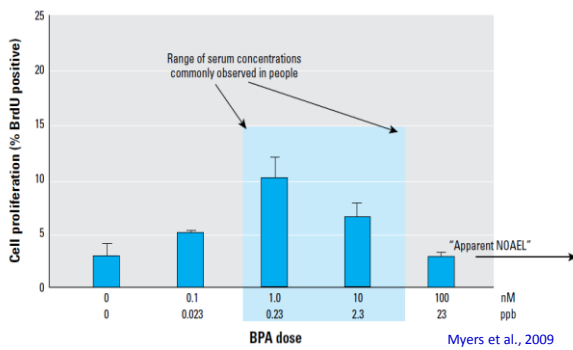
Low doses/non-monotonic DSC

The low dose controversy exemplified by bisphenol A

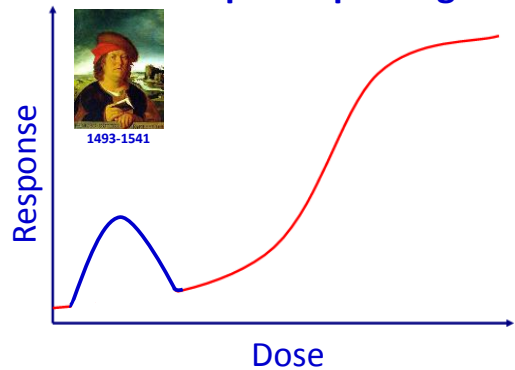
Körbäretomat	199,00		
Plastkasse liften	9,95		
Råborod	2,00		
Ägg 12-pack Kronäg	16,95		
Pant	21,95		
	-4,00		
Total	304,70		
Momsx	Moms	Netto	Brutto
25,00	0,40	1,60	2,00
12,00	11,11	92	
6,00			



BPA induces cell proliferation in cancer cells



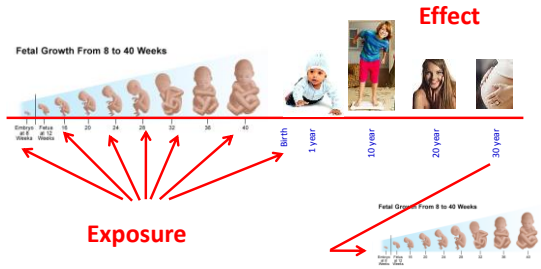
The dose-response paradigm



Four reasons for emerging public health concern

Low doses/non-monotonic DSC
The persistence of effects

Timing and/or stage of development is as critical as dose!!!



Four reasons for emerging public health concern

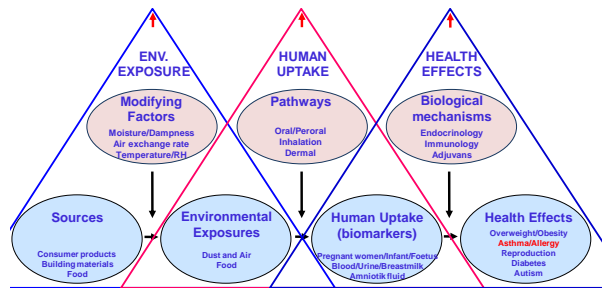
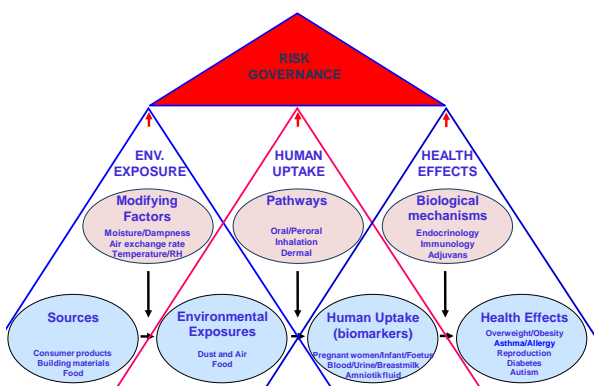
Low doses/non-monotonic DSC
The persistence of effects
The ubiquity of exposure



Four reasons for emerging public health concern

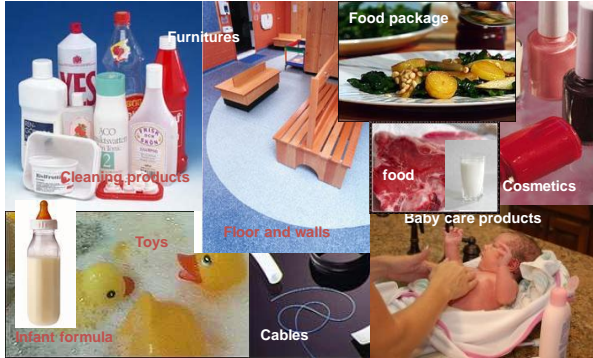
- Low doses/non-monotonic DSC
- The persistence of effects
- The ubiquity of exposure
- The wide range of health effects

ginnin a lifetime of vulnerability. A recepto to exposures to endocrine-disrupting chemicals that in h life.



Phthalates as an example

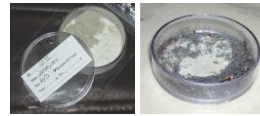
Soft PVC and many other consumer products includes **phthalates**



Phthalates are **routinely** found everywhere, however, mainly **indoor** in air and dust since the **sources** are there!!

Phthalate mass-fractions (ng g⁻¹) in dust samples collected from residences as reported in relevant studies. Present results listed for comparison. All values are median unless stated otherwise.

Reference	Country	n	DEHP	DBP	DEHP/DBP	DEHP
Pöschner et al. (1997)	Germany	272	3.1	0.7	—	450
de et al. (1997) ^a	Norway	38	10	100	10	640
Bauer et al. (2001) ^b	Germany	286	—	49	34	740
Recher et al. (2002)	Germany	199	3.3	42	22	15
Clayton et al. (2003)	Denmark	15	—	—	—	3244
Clayton et al. (2003): schools ^c	Denmark	23	—	—	—	858
Clayton et al. (2003): homes ^d	Denmark	23	—	—	—	858
Riedel et al. (2001)	USA: MA	139	5	20	1.9	45
Kersten and Koch (2003)	Germany	65	5	47	33	600
Wilson et al. (2003): homes ^e	USA: NC	9	—	1.2	—	5.9
Wilson et al. (2003): daycare centers ^f	USA: NC	4	—	1.9	—	3.7
Fromme et al. (2004a) ^g	Germany	30	6.1	47	36	29
Recher et al. (2004)	Germany	252	—	—	—	515
Morgan et al. (2004): homes	USA: OH	127	—	5.2	—	17
Morgan et al. (2004): daycare centers	USA: OH	16	—	15	—	29
Morgan et al. (2004): homes	USA: NC	129	—	5.6	—	17
Morgan et al. (2004): daycare centers	USA: NC	13	—	14	—	58
Bornhaeg et al. (2005)	Sweden	946	—	150	45	135
Hwang et al. (2008)	USA: CA	11	—	—	—	386
Bulgariu et al. (2008a)	Bulgaria	177	360 ^h	9030 ^h	—	140
Abb et al. (2009)	Germany	30	—	87	—	15
This study: homes	Denmark	499	1.7	15	77	5.7
This study: daycare centers	Denmark	151	2.2	38	23	17



Atmospheric Environment 44 (2010) 2294–2301

Phthalates are **routinely** found in humans in adults, in infants, in children, and in pregnant women (fetus)

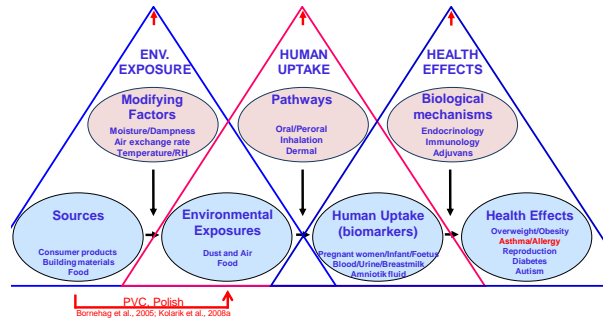


Levels of DEHP metabolites in urine (µg/l) – Results from different population studies.

Study/region	sample/age	MEHP		SOHH-MEHP		Mono-MEHP		Di-MEHP		Tri-MEHP	
		P50	P95	P50	P95	P50	P95	P50	P95	P50	P95
GERES IV Germany (this study)	children, N = 599; 3 to 14 years	6.7	25.1	46.0	164	36.3	123	61.4	209	20.4	76.7
GERES IV – Pilot Study 4 sampling locations, Germany (Recher et al., 2004)	children, N = 254; 3 to 14 years	7.2	28.3	52.1	188	41.4	139	—	—	—	—
Environmental Specimen Bank, Minster, 2003, Germany (Witznack et al., 2007)	students, N = 60; 20 to 29 years	4.6	25.2	13.4	39.8	12.2	35.0	17.5	60.6	5.6	21.7
Germany (Fromme et al., 2007)	general population, N = 399, 14 to 60 years	4.9	21.7	19.2	81.8	14.7	56.0	26.2	93.6	8.3	41.3
NHANES 2001 – 2002, USA (CDC, 2005)	general population, N = 393, 6 to 11 years	4.4	28.9	32.9	210	22.6	142	—	—	—	—
NHANES 1999 – 2000, USA (CDC, 2003)	general population, N = 328, 6 to 11 years	4.9	34.5	—	—	—	—	—	—	—	—

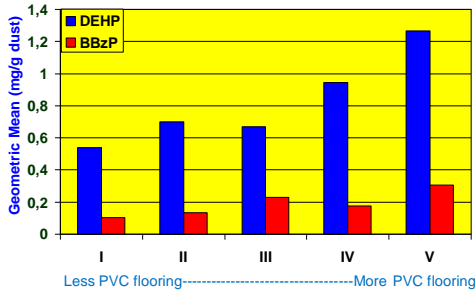
Notes: N = sample size; P50, P95 = percentiles.

Int. J. Hyg. Environ. Health
Becker et al., 2009

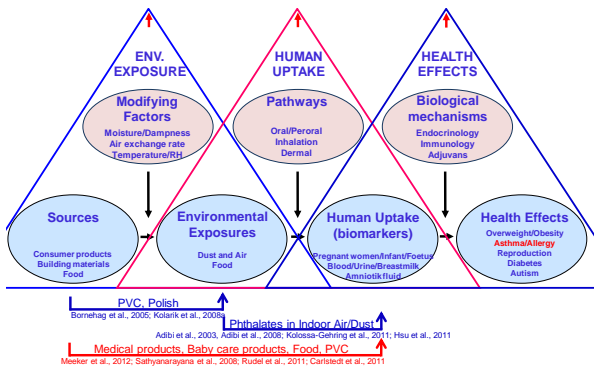
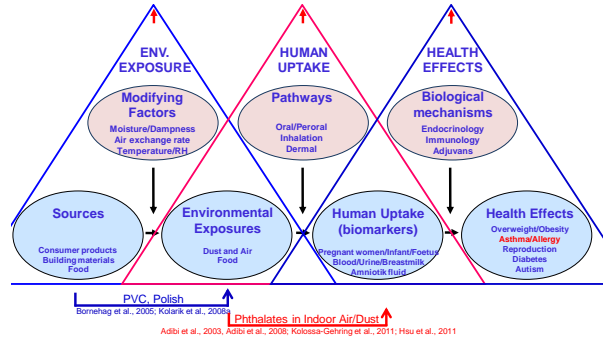


Phthalate concentration in dust vs. Frequency of PVC flooring in the home

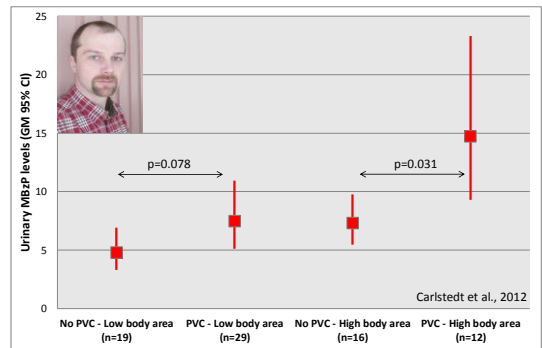
DBH-phase II Sweden

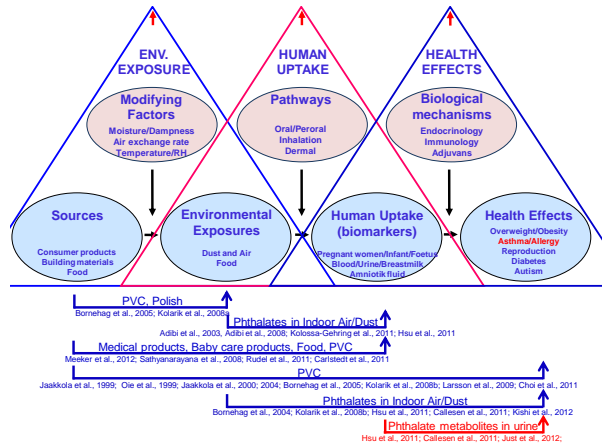
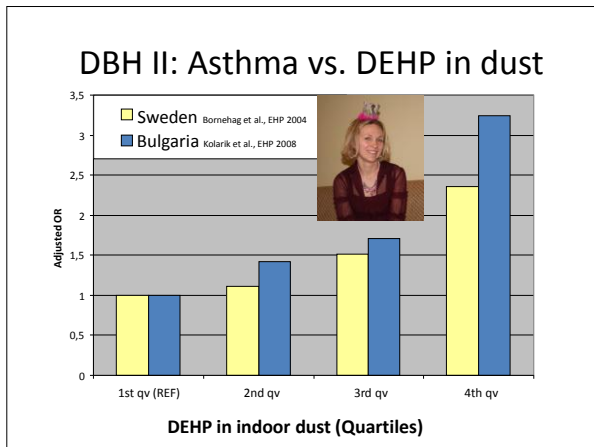
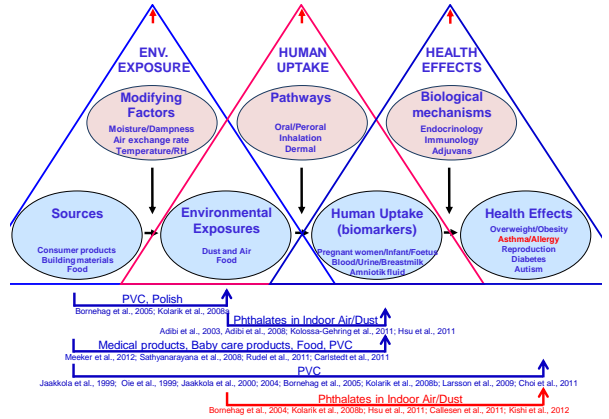
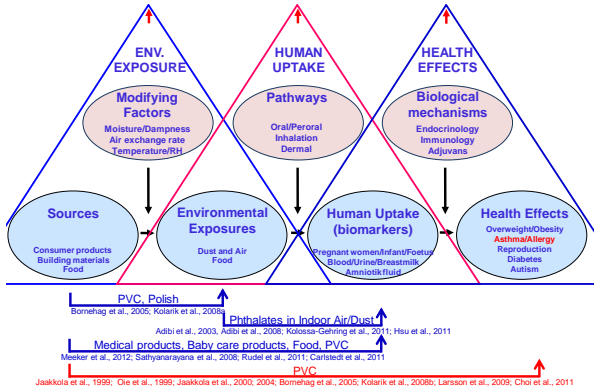


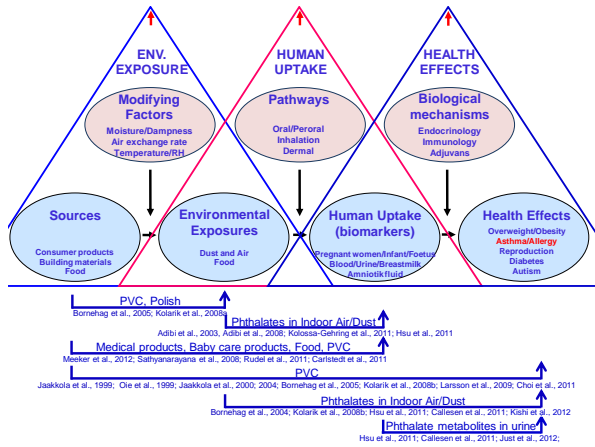
Bornehag et al., 2005



Urinary MBzP in infants vs. PVC







Hur mycket ska vi veta innan vi agerar?

- Ftalater i plast, leksaker, kosmetika, föda.....
- Bisphenol a i..... etc. etc...
- Another number of molecules with endocrine disrupting properties.....