



Deildin fyri Arbeiðs-
og Almannaheilsu



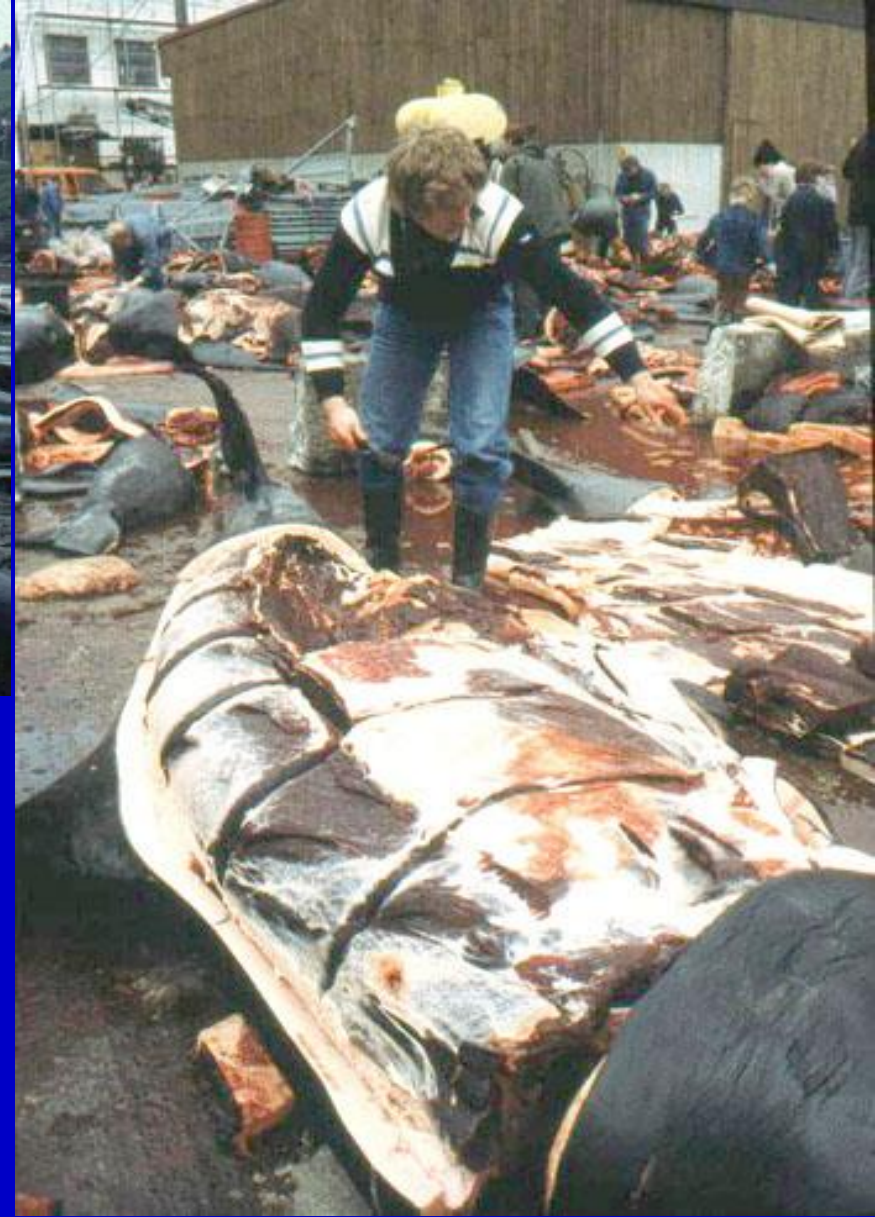
Immunverjan ávirkast av dálkandi evnum úr havinum

Pál Weihe
yvirlækni

Sjúkrahúsverk Føroya

Sigmundargøta 5, Postsmoga 14, FO-110 Tórshavn

Tlf.: +298 31 66 96, Fax: +298 31 97 08, T-postur: dfaa@health.fo



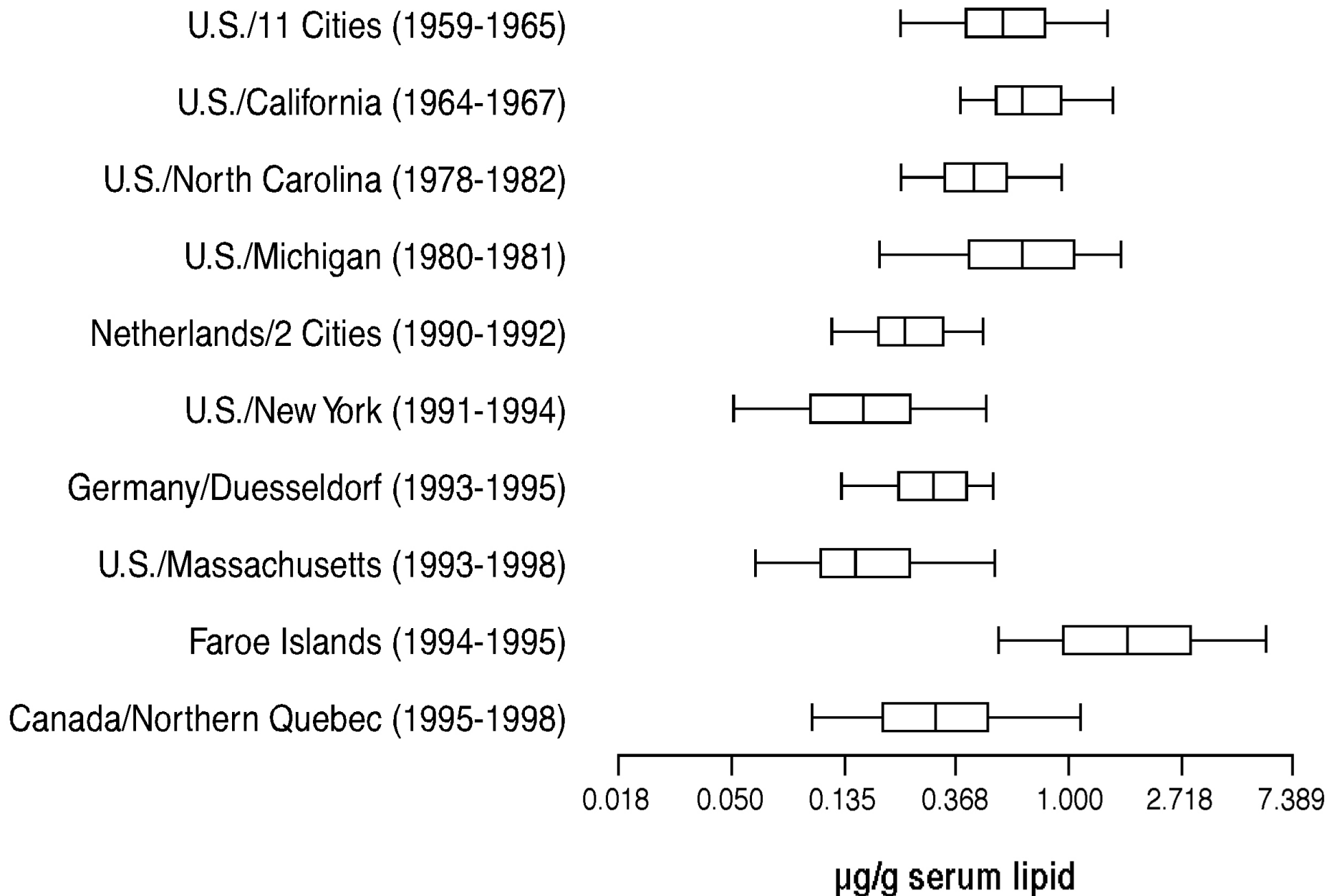
Grindahvalur er
dálkaður:

Methylkviksilvur er í
tvøstinum og PCB í
spikinum.

Dálkandi evni í hvali – av týdningi fyri mannaheilsu

- Kviksilvur (methyلكviksilvur)
- Persistent organic pollutants (POPIr):
 - Pesticidir (DDT, Toxaphene, etc.)
 - Polyklorerað bifenyliir (PCBs)
 - Onnur evni úr ídnaðinum (HCB, etc.)
 - Dálking frá skipum (organotin, etc.)

PCB konsentrati3n í serum í 10 ymiskum kanningum



Loveren H.V. et al.

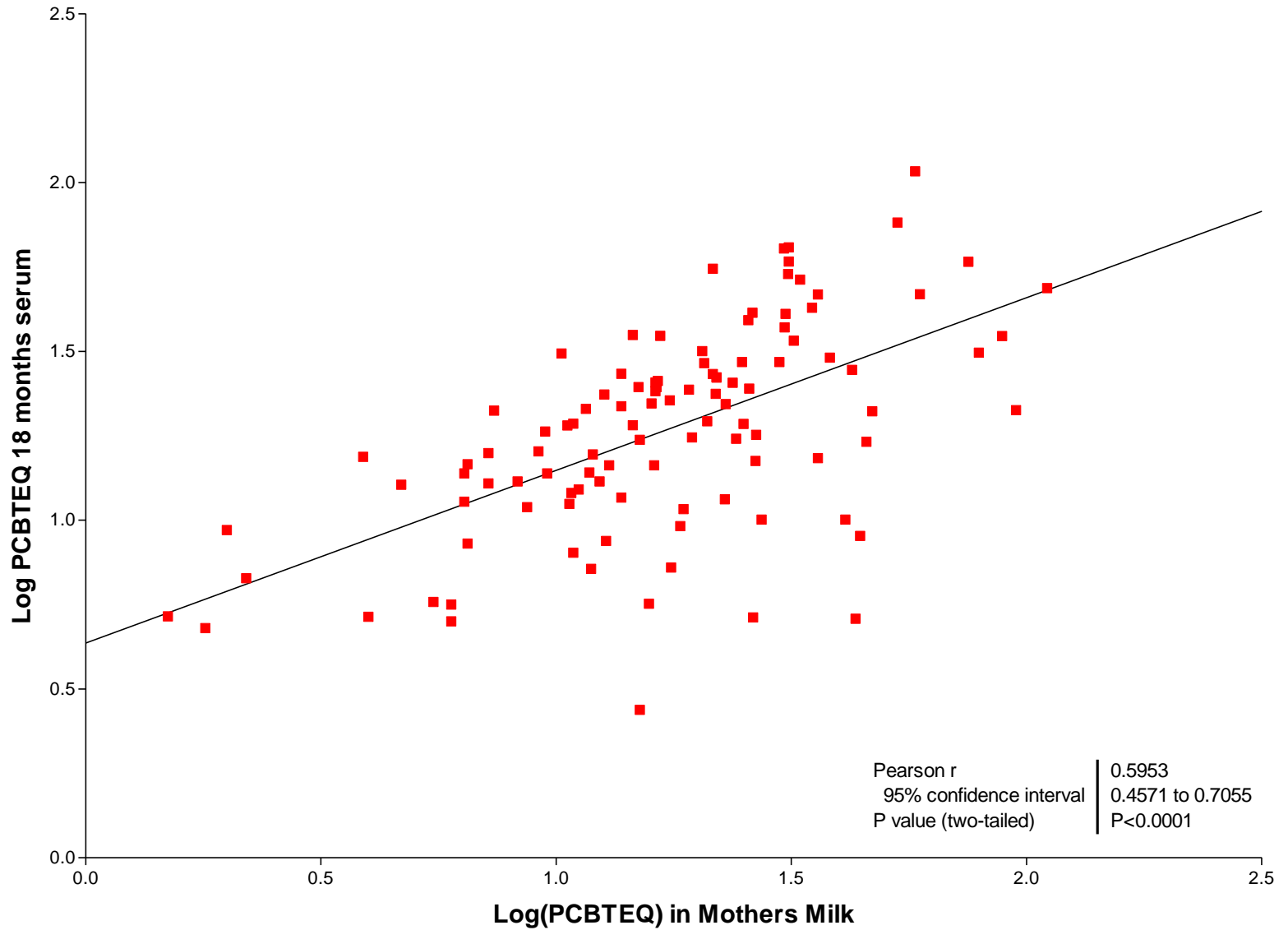
(Report of the Bilthoven Symposium 1999):

“...til tess at meta um niðurbinding av immunverjuni ber til at nýta andevnissvarið uppá koppingarevnið, sum kroppurin ongantíð hevur verið út fyri áður....

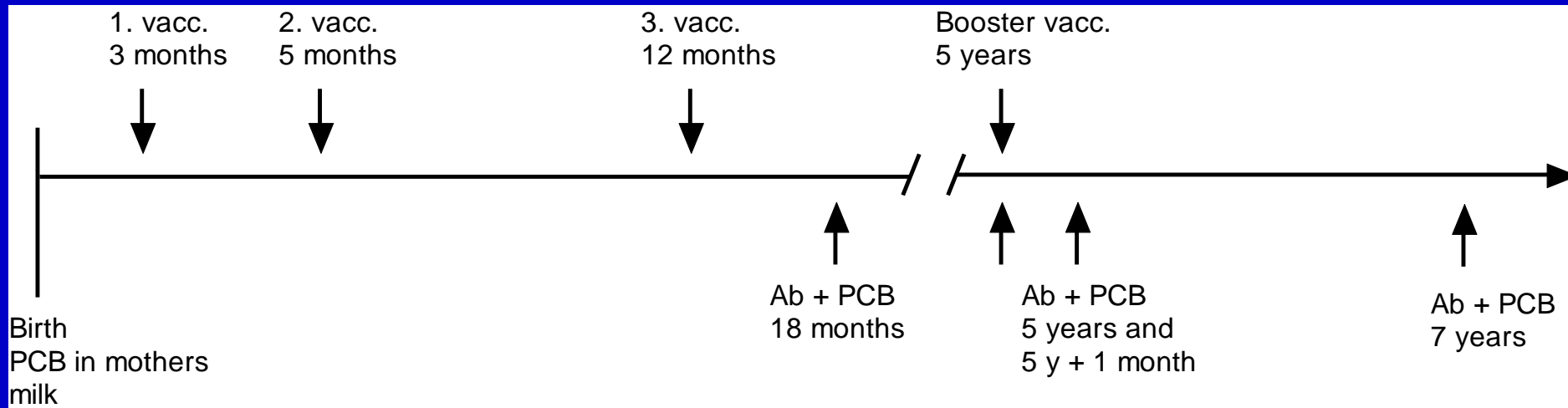
Tað skal tí staðiliga vera mælt til at brúka barnavaccinátiónirnar meira sum ein hátt at kanna, hvussu immunverjan starvar.”

Loveren H.V. et al. Report of the Bilthoven Symposium: Advancement of Epidemiological Studies in Assessing the Human Health Effects of Immunotoxic Agents in the Environment and the Workplace. Biomarkers, Volume 4, Number 2, 1 March 1999, pp. 135-157(23)

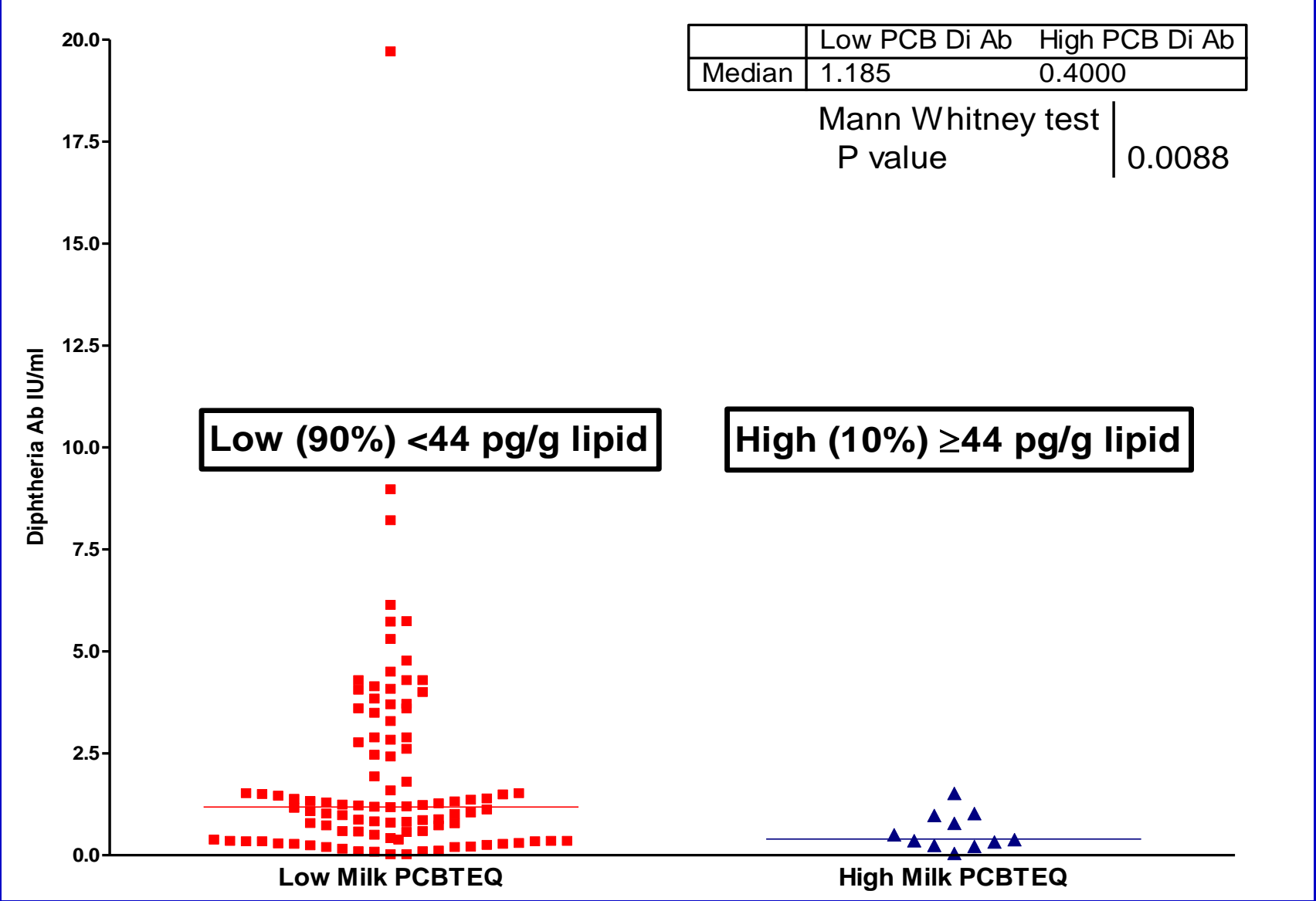
Correlation between PCB in Mothers Milk and 18 Months Serum



Yvirlit yvir kanningarnar av difteritis- og stívkrampaandevnum hjá føroyskum børnum, sum tíðliga í lívinum hava verið fyri PCB, tí mamma teirra hevði etið PCB dálkaðan mat.



Høg PCB virði í móðurmjólk gera tað meira sannlíkt, at differeritis andevni eru lág, tá tey verða máld við 18 mánaðar aldur



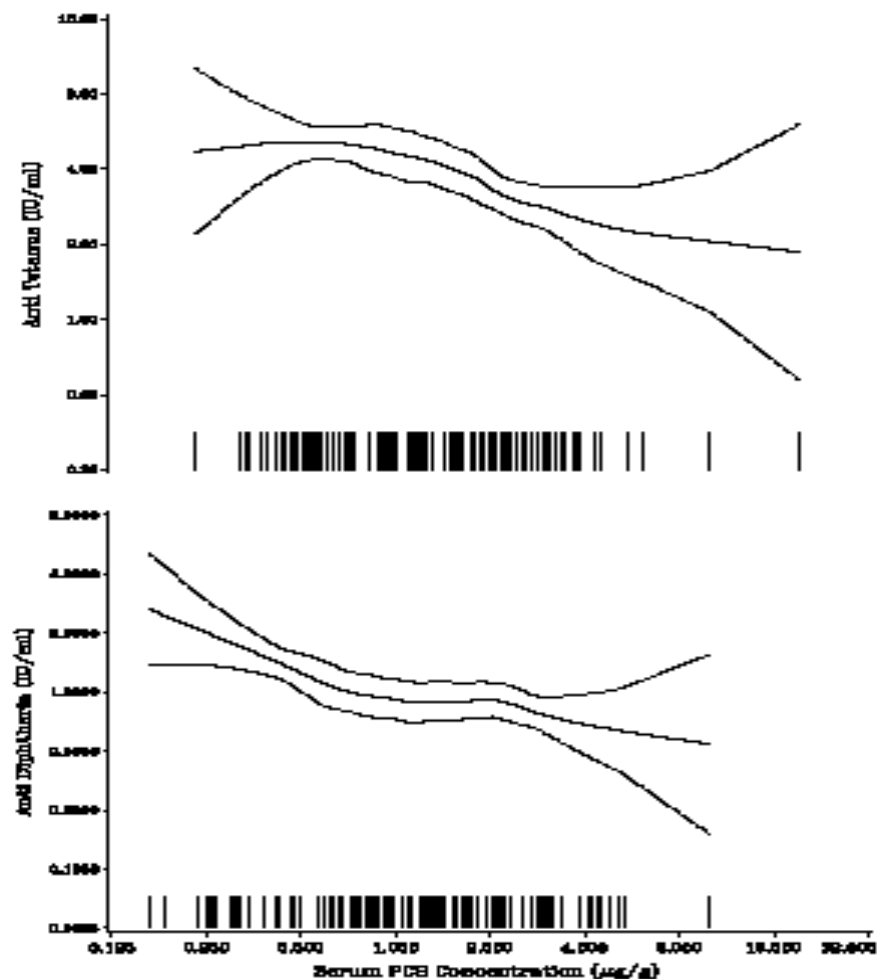
Reduced Antibody Responses to Vaccinations in Children Exposed to Polychlorinated Biphenyls

Carsten Heilmann¹, Philippe Grandjean^{2,3*}, Pål Weihe^{2,4}, Flemming Nielsen², Esben Budtz-Jørgensen^{2,5}

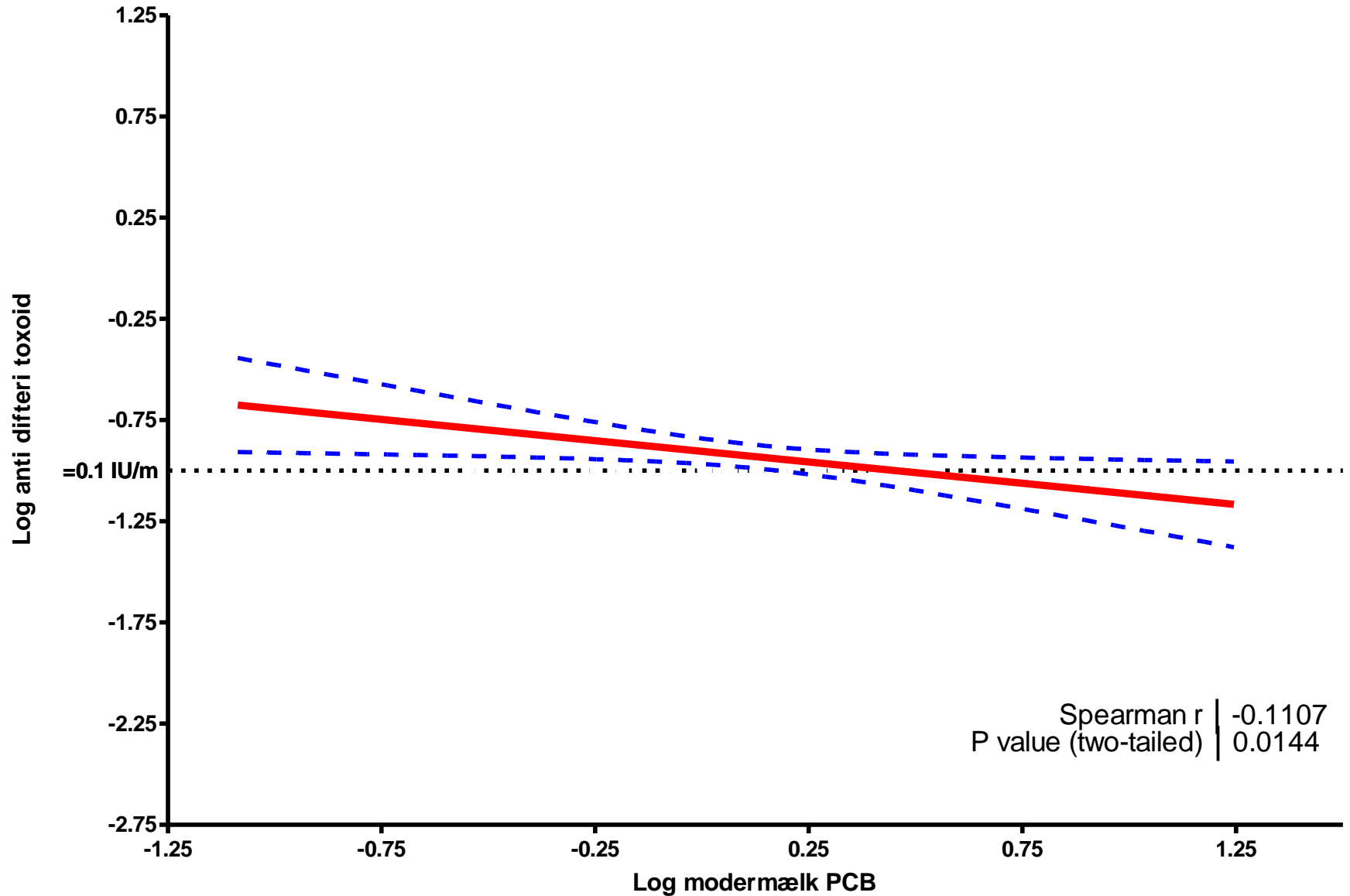
Dose-effect relationship between PCB exposure and antibody response to antigens from routine childhood vaccinations.

Upper panel: Maternal serum concentration of PCBs plotted against serum tetanus antibody concentrations at 7 years of age.

Lower panel: Serum concentrations of PCBs against serum diphtheria antibody concentrations, both at 18 months of age.



Negative Correlation Between Mothers Milk PCB and Diphtheria Toxoid Antibodies in 5-years Healthy Faeroese Children (N:488)



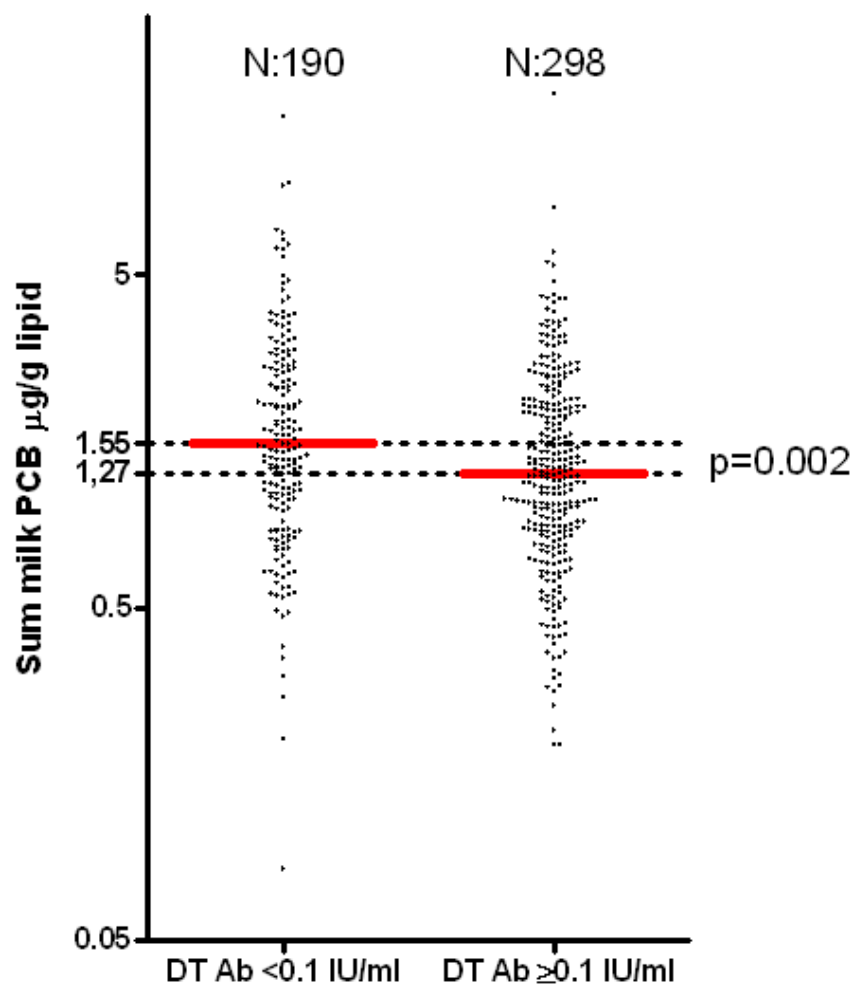
Effect on antibody concentrations at
 ages 5 years (pre-boosted) and 7 years
 associated with a doubling of PCB exposures*) at 18 months

Antigen	Change %	p
Tetanus		
5 years	-4.5	0.51
7 years	-19.1	0.01
Diphtheria		
5 years	-15.6	0.02
7 years	-16.6	0.06

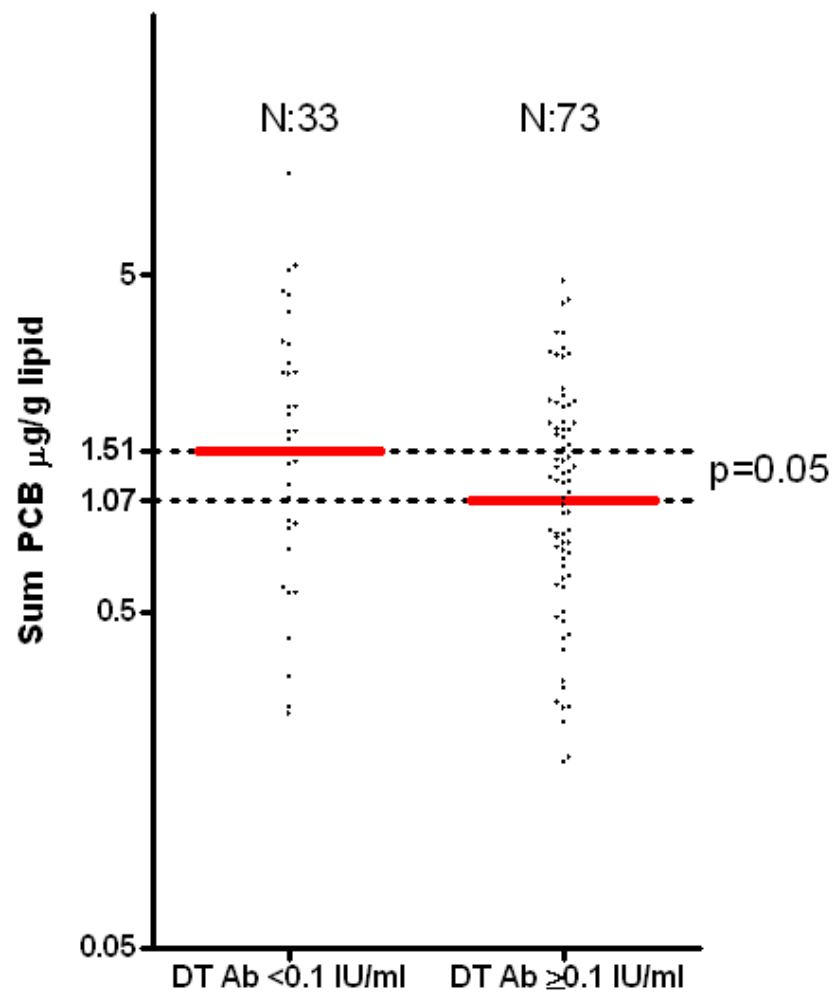
*)adjustment for missing observations

PCB Concentrations in Children with Low or High Diphtheria Toxoid Antibodies at Age 5 Years

PCB Concentration in Mothers Milk



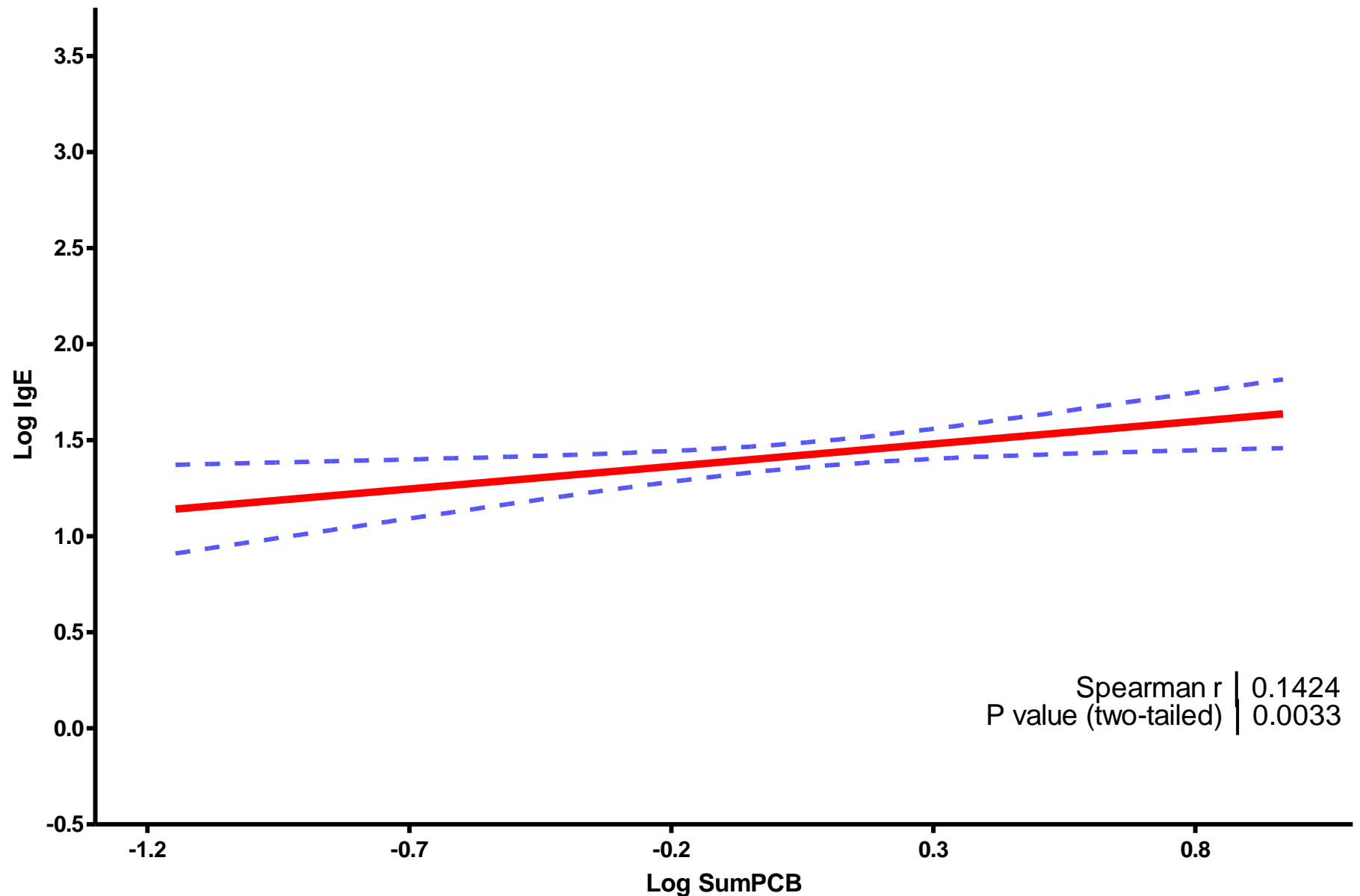
PCB Concentrations in Serum of Children 18 Months



Do PCBs cause a general reduction in
immunity

or do they cause early immune
dysregulation caused by an adverse
influence on the thymic function?

Positiv korrelation mellem plasma PCB og IgE hos 7 år gamle raske færøske børn (N:424)



Geometric means (and interquartile range) for PCB exposure and breastfeeding in regard to tertiles of serum **total IgE in 464 birth cohort members at age 7 years**

Exposure parameter	Serum total IgE concentration (kU/L)			<i>p</i>
	Low (<13.6)	Medium (13.6-47.7)	High (>47.7)	
PCB (µg/g serum lipid)				
Prenatal	1.16 (0.73-1.79)	1.17 (0.76-1.97)	1.29 (0.83-2.3)	0.30
5 years	1.00 (0.54-1.85)	1.19 (0.76-1.91)	1.27 (0.81-2.2)	0.01
7 years	0.66 (0.35-1.30)	0.74 (0.46-1.26)	0.88 (0.56-1.47)	0.005
Duration of breast-feeding (months)				
Exclusive	4.2 (3-6)	4.8 (4-6)	5.0 (4-6)	0.003
Total	9.2 (5-12)	10.0 (7-12)	10.8 (7-13)	0.15

Conclusions

- PCB exposure – most clearly expressed at age 18 months – may cause a negative effect on the long-term ability to produce antibodies to standard T-lymphocyte dependent antigens
- The reaction to a booster at age 5 years is most clearly affected by the concomitant serum-PCB
- The total IgE concentration at age 7 years is positively associated with the current PCB
- Immunotoxicant exposure may lead to both stimulation and suppression of immune system functions

Ósvaraðir spurningar

- Hvør aldur er mest sárbærur fyri immunotoksisk árin – og halda árinini sær, tá ið børnini eru vaksin
- Ávirka immunotoksin áðrenn burðin, eftir burðin ella saman allergitítleikan og IgE nøgdina
- Eru blóð lymfocyttaþpopulatióinir og cytokinir ávirkaði av immunotoksiskari eksponering
- Hvørji dálkandi evni eru tey, sum virka immunotoksisk og í hvørjum nøgdum
-

Kanningarliðið í 2000

