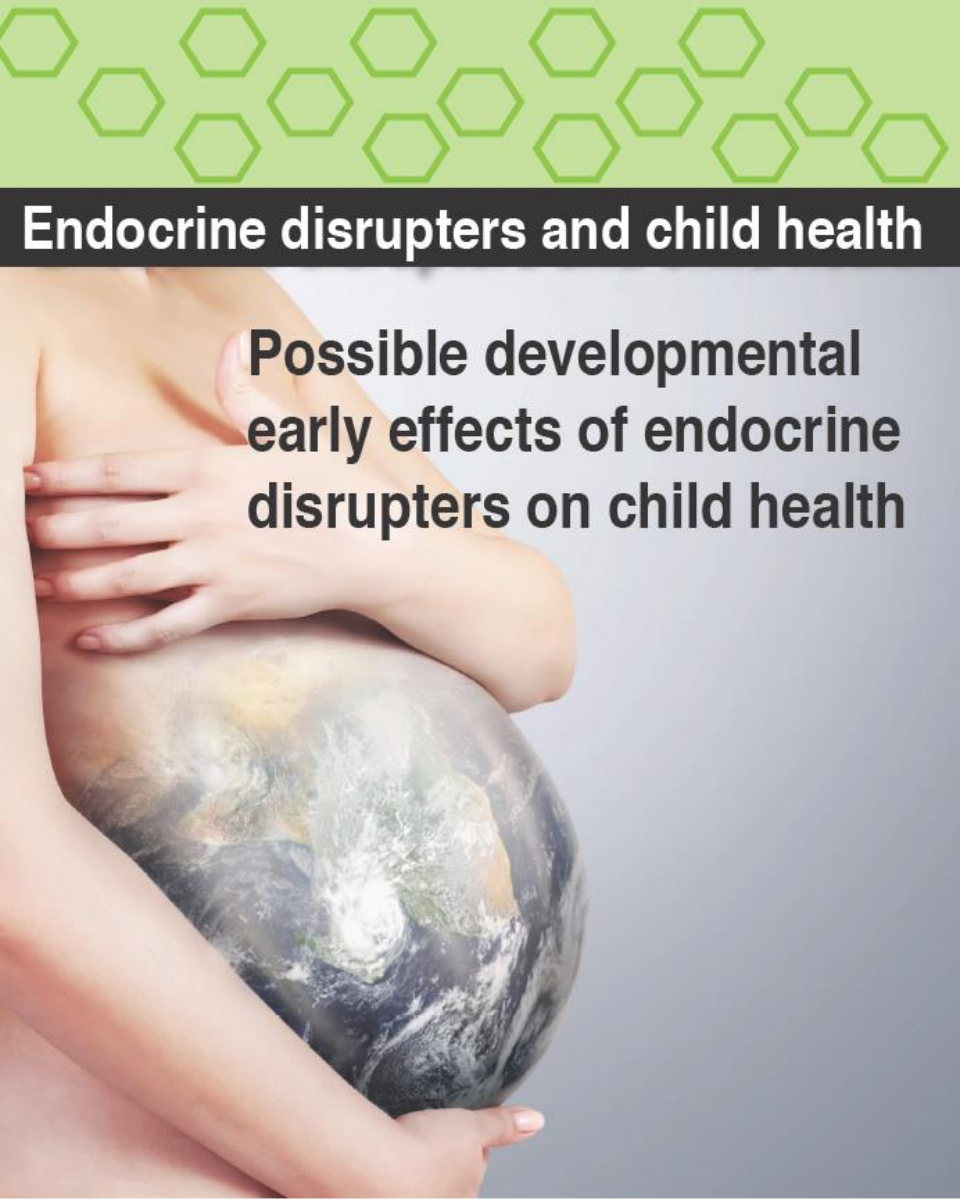
Arjen altistus hormonihäiriköille - mistä se syntyy ja onko se ongelma viimeisimmän tutkimustiedon valossa

Jorma Toppari

2017

Tärkeimmät huolenaiheet

- Hormoneihin liittyvien sairauksien suuri esiintyvyys ja nopea yleistyminen
- Havaitut Hormonaalisten haitta-aineiden vaikutukset eläinkunnassa
- Laboratorio- ja ihmistutkimuksissa havaitut yhteydet hormonaalisten haitta-aineiden ja sairauksien välillä
- Kasvava lukumäärä kemikaaleja, joitten on todettu olevan hormonaalisia haitta-aineita ja niitten uudet vaikutusmekanismit
- Lisääntynyt altistuminen ja kemikaalikuorma ympäri maapalloa
- Terveysriskit todennäköisesti aliarvioitu
- Tiedon puute hormonaalisten haitta-aineiden altistuslähteestä
- Puutteellinen testaus



Kirjoittajat:

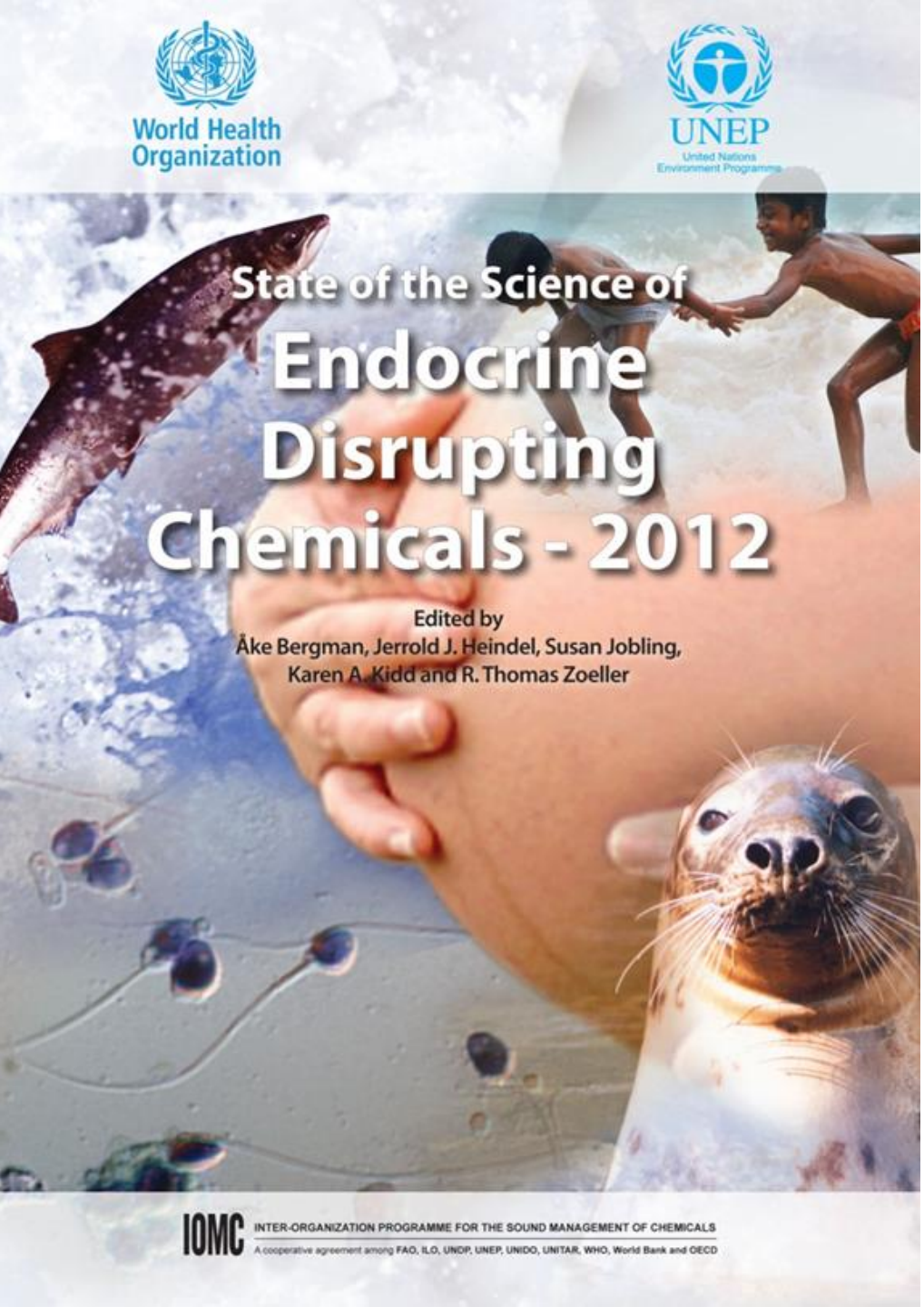
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- Tracey J. Woodruff, USA
- R. Thomas Zoeller, USA

ENDOCRINE SOCIETY



1: Gore AC, Chappell VA, Fenton SE, Flaws JA, Nadal A, Prins GS, Toppari J, Zoeller RT. EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals. Endocr Rev. 2015 Dec;36(6):E1-E150. doi: 10.1210/er.2015-1010. Review. PubMed PMID: 26544531; PubMed Central PMCID: PMC4702494.

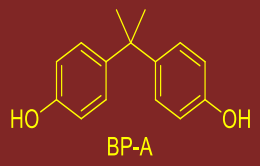
2: Gore AC, Chappell VA, Fenton SE, Flaws JA, Nadal A, Prins GS, Toppari J, Zoeller RT. Executive Summary to EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals. Endocr Rev. 2015 Dec;36(6):593-602. doi: 10.1210/er.2015-1093. Review. PubMed PMID: 26414233; PubMed Central PMCID: PMC4702495.

Yli 1000 tunnettua hormonaalista haitta-ainetta

Vain murto-osa kemikaaleista on testattu

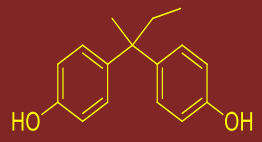
- Tuholaismyrkyt
- Palonestoaineet
- Muovit
- Kasvinsuojeluaineet
- Teolliset sivutuotteet
- Muovinpehmentimet
- Hygieniatuotteet
- Surfaktantit
- Kosmetiikka
- Liuottimet
- UV-suoja-aineet
- Antioksidantit
- Raskasmetallit
- POP
- Polysykliset yhdisteet

Bisfenolit

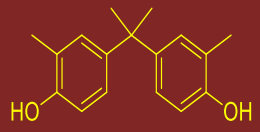


BP-A

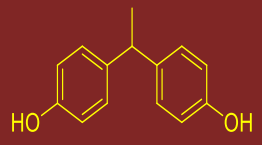
BPA



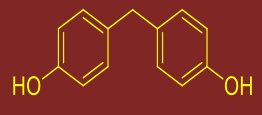
BP-B



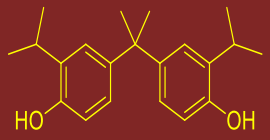
BP-C



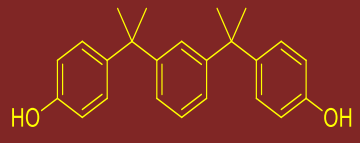
BP-E



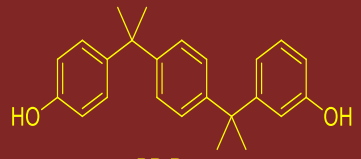
BP-F



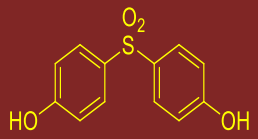
BP-G



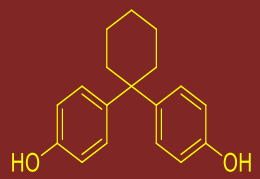
BP-M



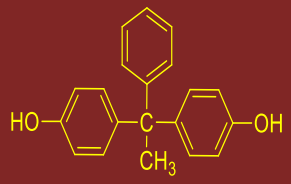
BP-P



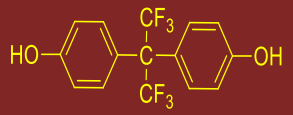
BP-S



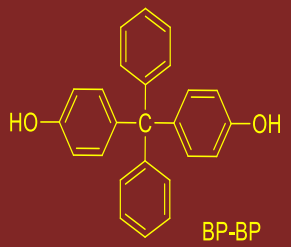
BP-Z



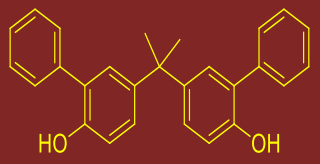
BP-AP



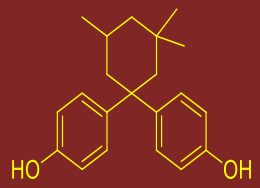
BP-AF



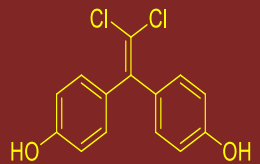
BP-BP



BP-PH



BP-TMC



BP-C2

Åke Bergman

SWETOX

Altistuminen hormonaalisille haitta-aineille tapahtuu kaikkialla

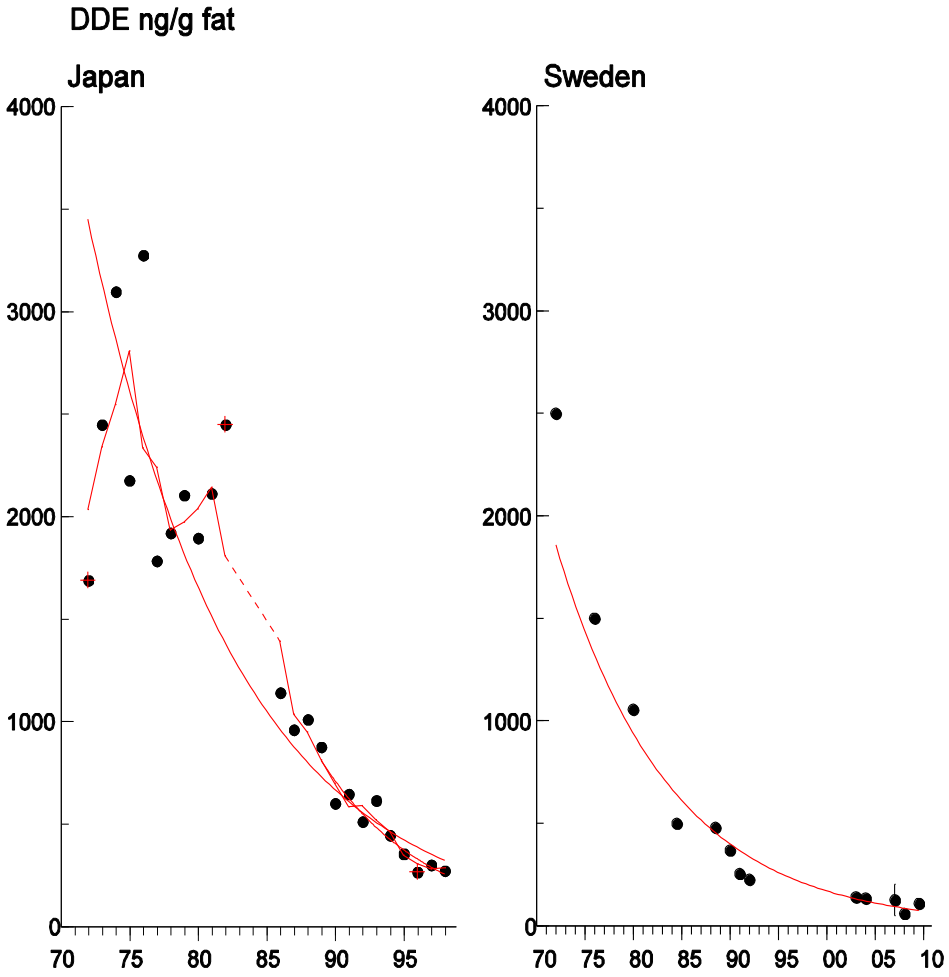






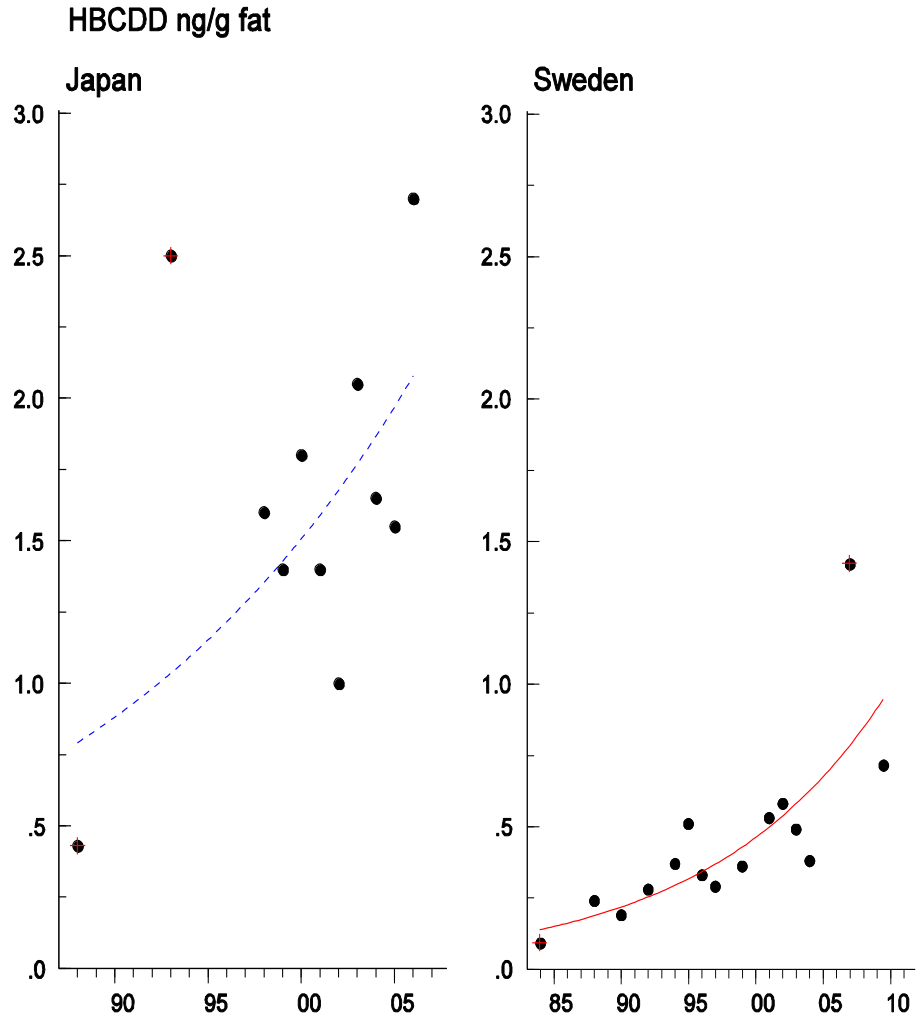
Sääntely vaikuttaa altistumiseen

Muutokset DDE:n pitoisuudessa (ng/g rasvaa) Japanissa ja Ruotsissa
Courtesy: Åke Bergman, Stockholm



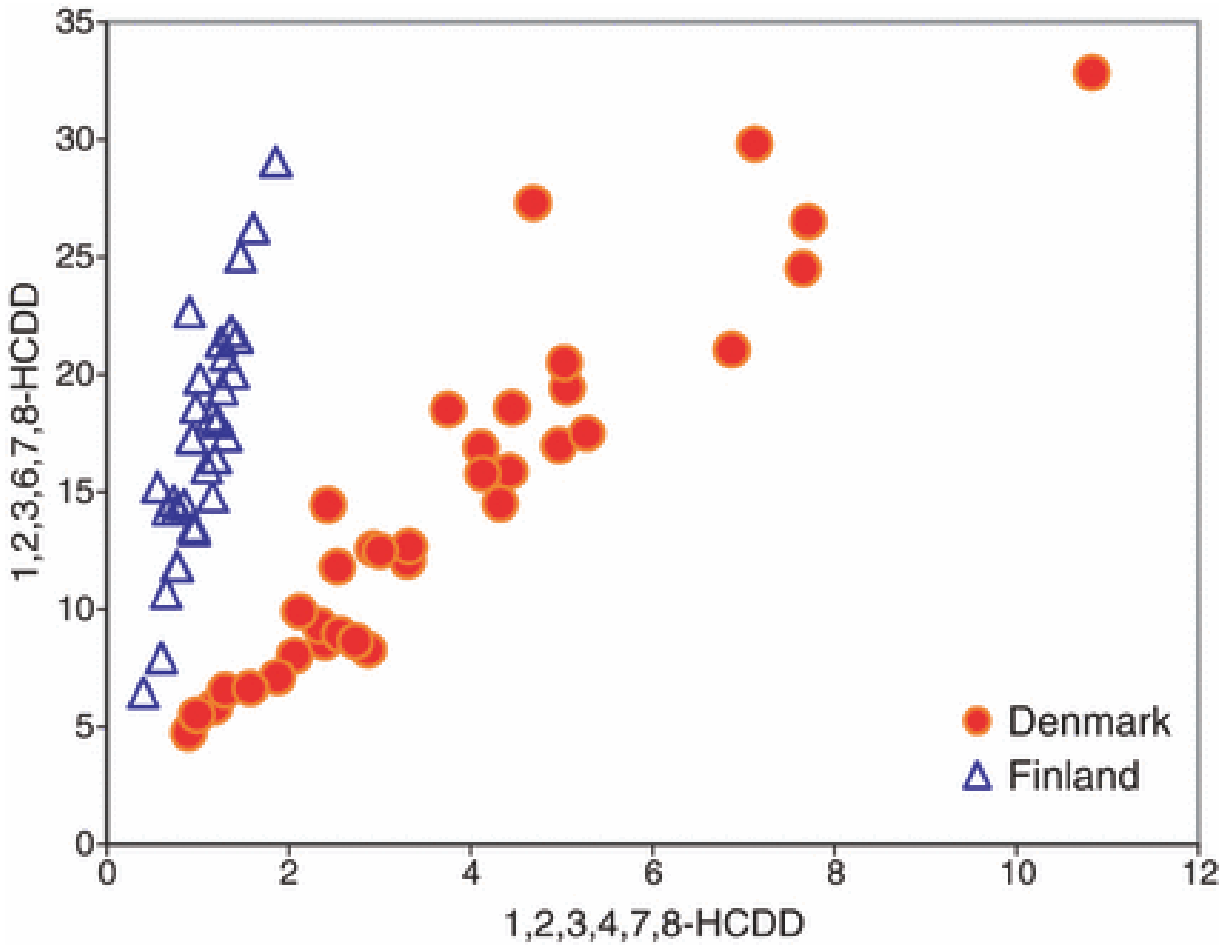
Uudet kemikaalit vanhojen tilalle

Hexabromocyclododecane (HBCD, palonestoaine)
Courtesy : Åke Bergman, Stockholm



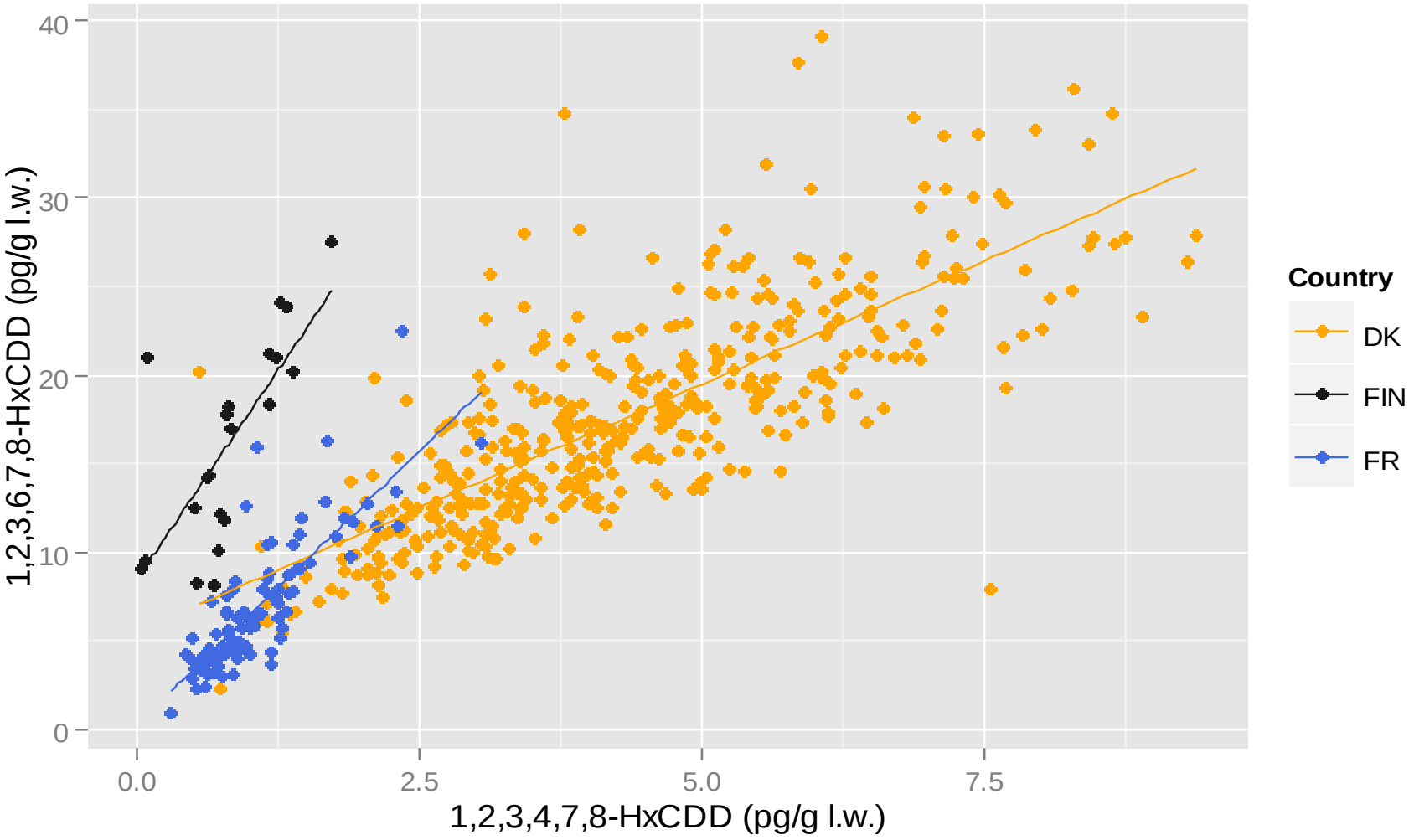
Kemikaalisormenjäljet Suomessa ja Tanskassa

Krysiak-Baltyn ym. Int J Androl. 2010

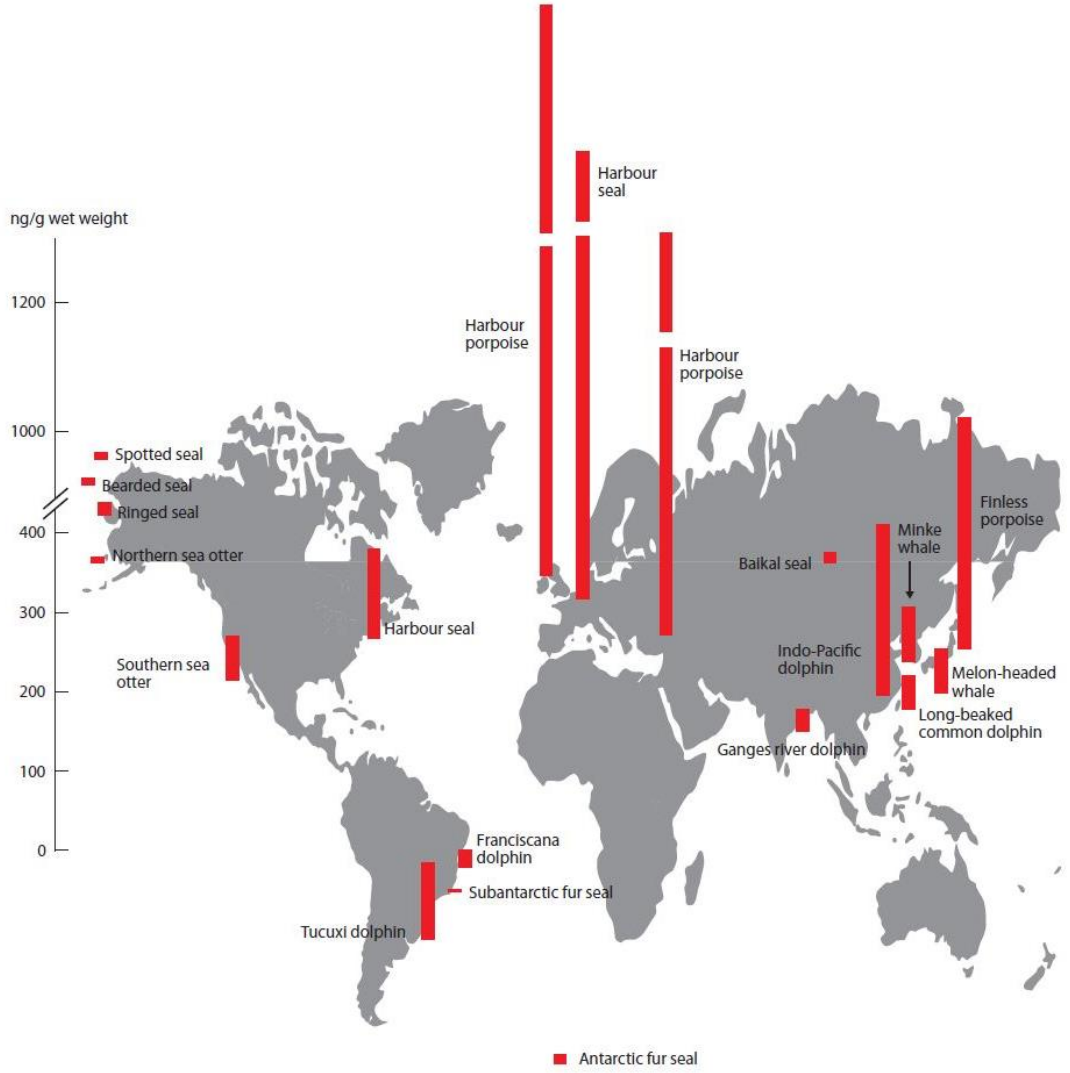


Volume 33, Issue 2,
http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2605.2009.00996.x/full#f3

Kemikaalisormenjäljet Suomessa, Tanskassa ja Ranskassa



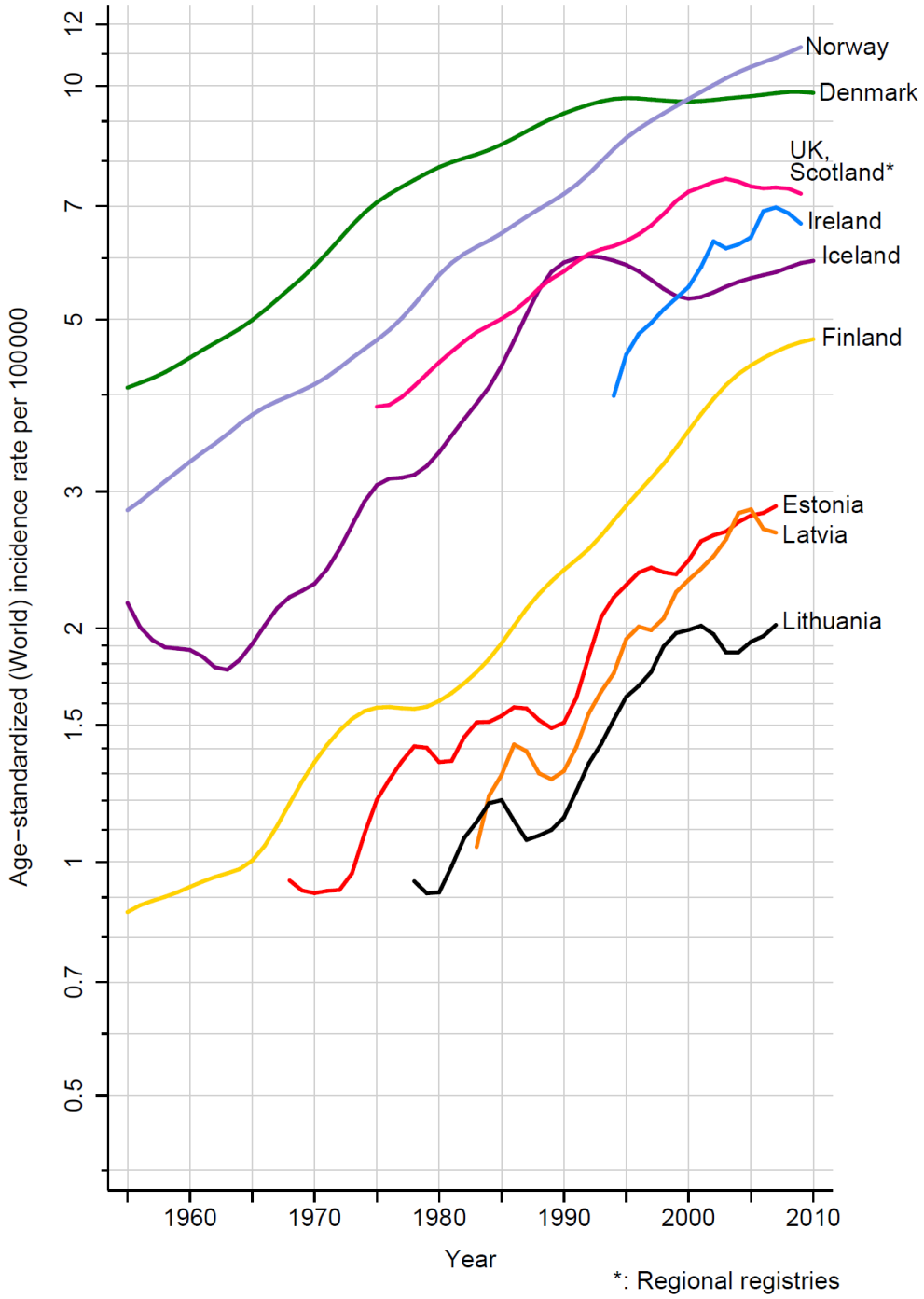
J.P. Antignac et al, **Country-specific chemical signatures of persistent organic pollutants (POPs) in breast milk of French, Danish and Finnish women** Environmental Pollution, Volume 218, 2016, 728–738



Perfluoro-oktaanisulfonaatti (PFOS)(ng/g) merinisäkkäiden maksassa

Kuva muokattu julkaisusta: Houde et al., Environ. Sci. Technol. (2011)

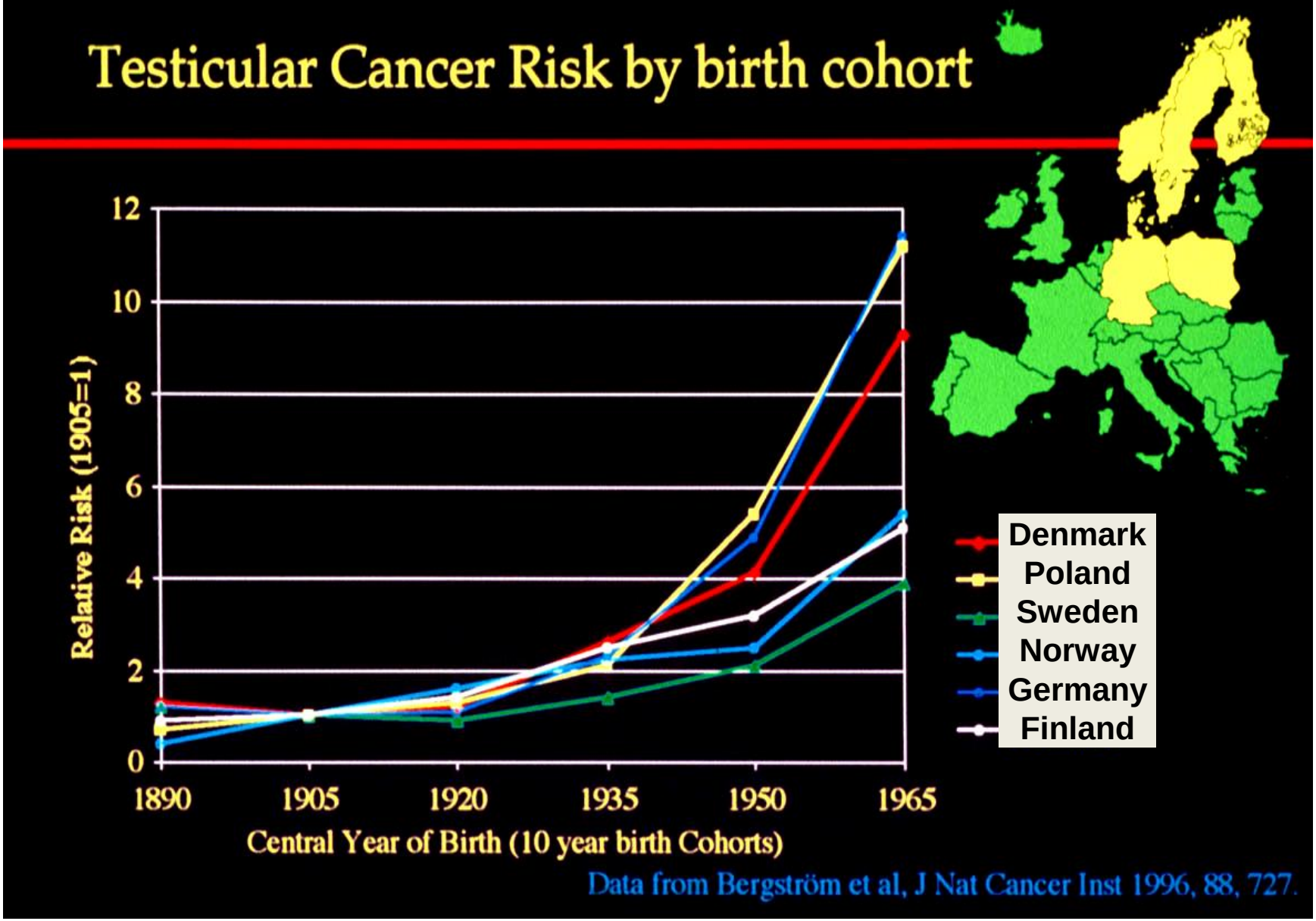
Kivessyövän esiintyvyys



Pohjois-Eurooppa

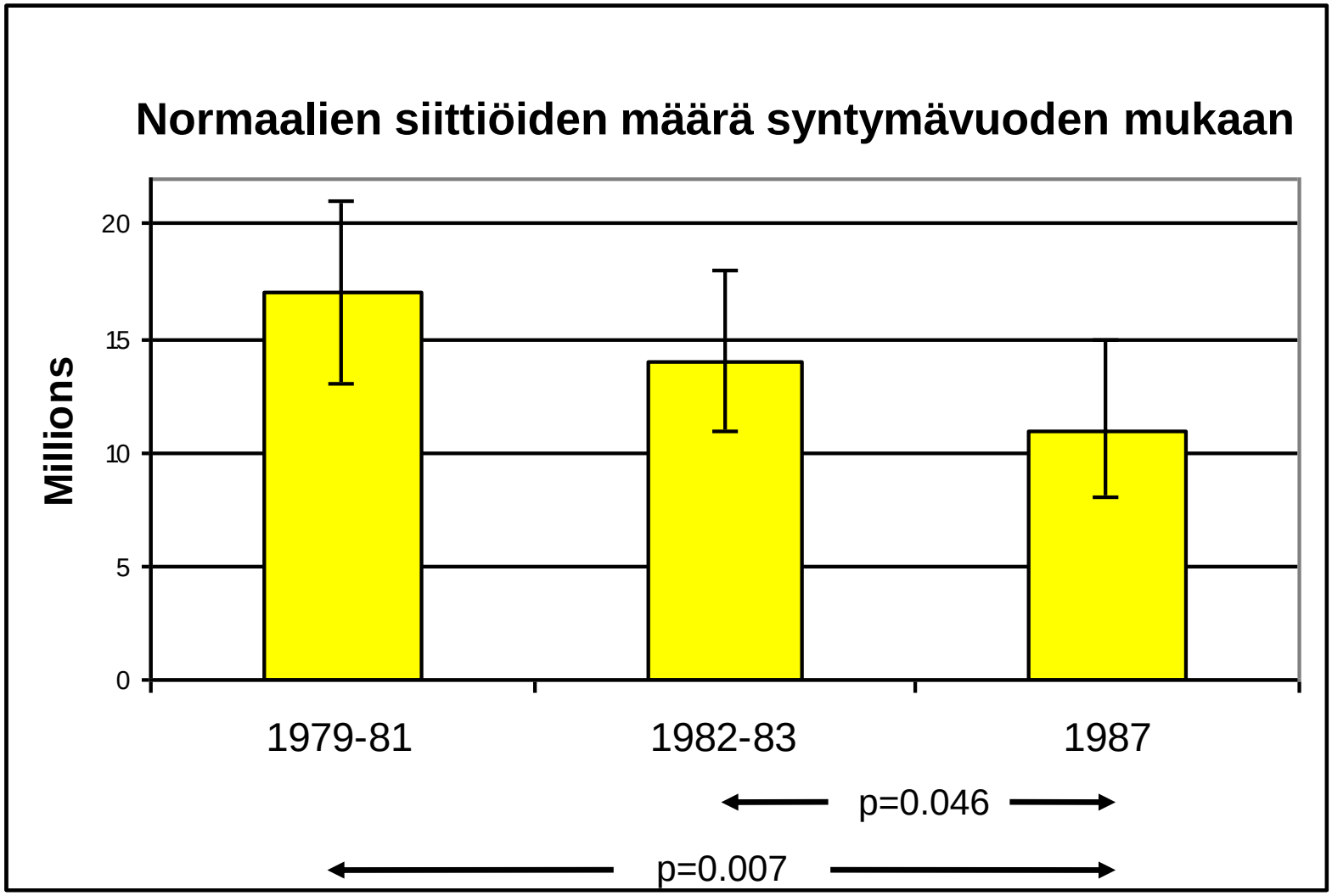
Znaor et al, European Urology, 2014

Testicular Cancer Risk by birth cohort



Data from Bergström et al, J Nat Cancer Inst 1996, 88, 727.

Nuoret suomalaismiehet



Jørgensen et al 2011, IJA

Altteimmat joukostamme

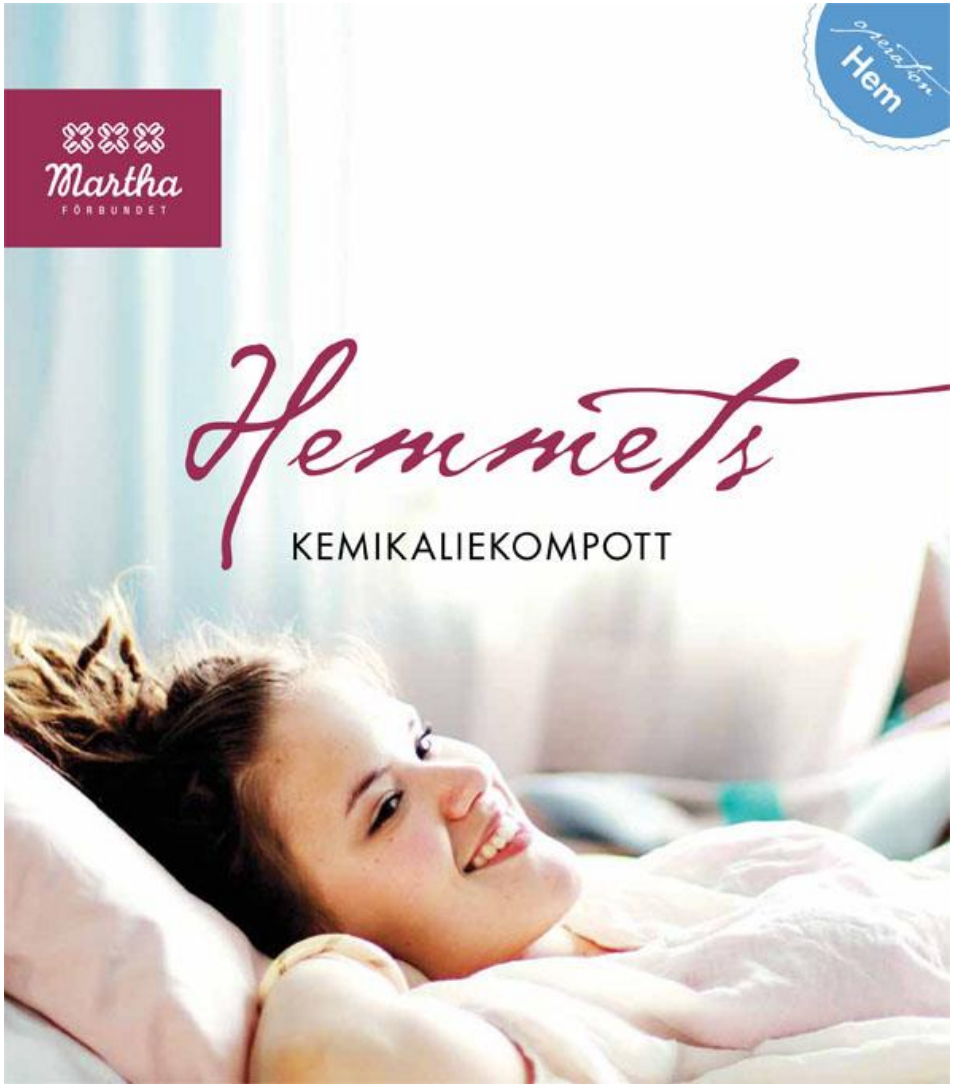
Sikiöt ja vastasyntyneet



ja kasvavat lapset



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European Commission - Press release

Commission presents scientific criteria to identify endocrine disruptors in the pesticides and biocides areas

Brussels, 15 June 2016

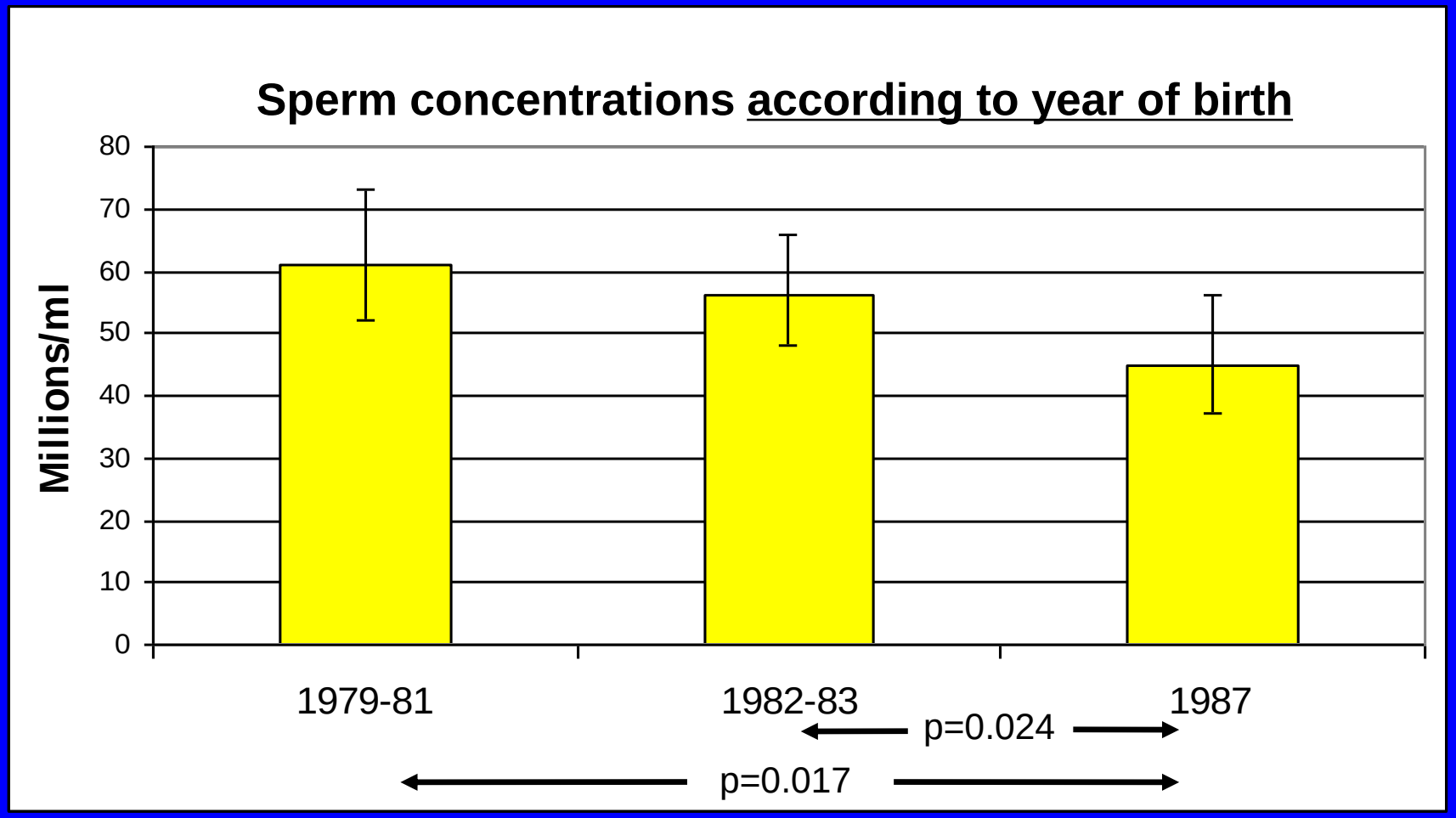
Jean-Claude Juncker said: "Endocrine disruptors can have serious health and environmental impacts and even if many substances containing them are already banned as a result of existing legislation on pesticides and biocides, we have to remain vigilant. The Commission is committed to ensuring the highest level of protection of both human health and the environment, which is why we are today putting forward strict criteria for endocrine disrupters – based on science – making the EU regulatory system the first worldwide to define such scientific criteria in legislation."

The Vice-President for Jobs, Growth, Investment and Competitiveness **Jyrki Katainen** declared: "The scientific criteria for endocrine disruptors presented today will contribute to the objectives of minimising exposure to endocrine disruptors and to bringing legal certainty. Today's Communication outlines the issues we have considered in this process, it defines the scope of what is relevant to determining the scientific criteria, and sets out the implications of setting these criteria – for the two pieces of legislation directly concerned and for other parts of the EU regulatory framework and actions."

Määritelmä

- The WHO defines an endocrine disruptor as "an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations“ “ulkoa tuleva aine tai seos, joka muuttaa hormonitoimintaa ja sen myötä aiheuttaa haittaa terveydelle koskemattomassa eliössä tai sen jälkeläisessä tai osajoukossa”

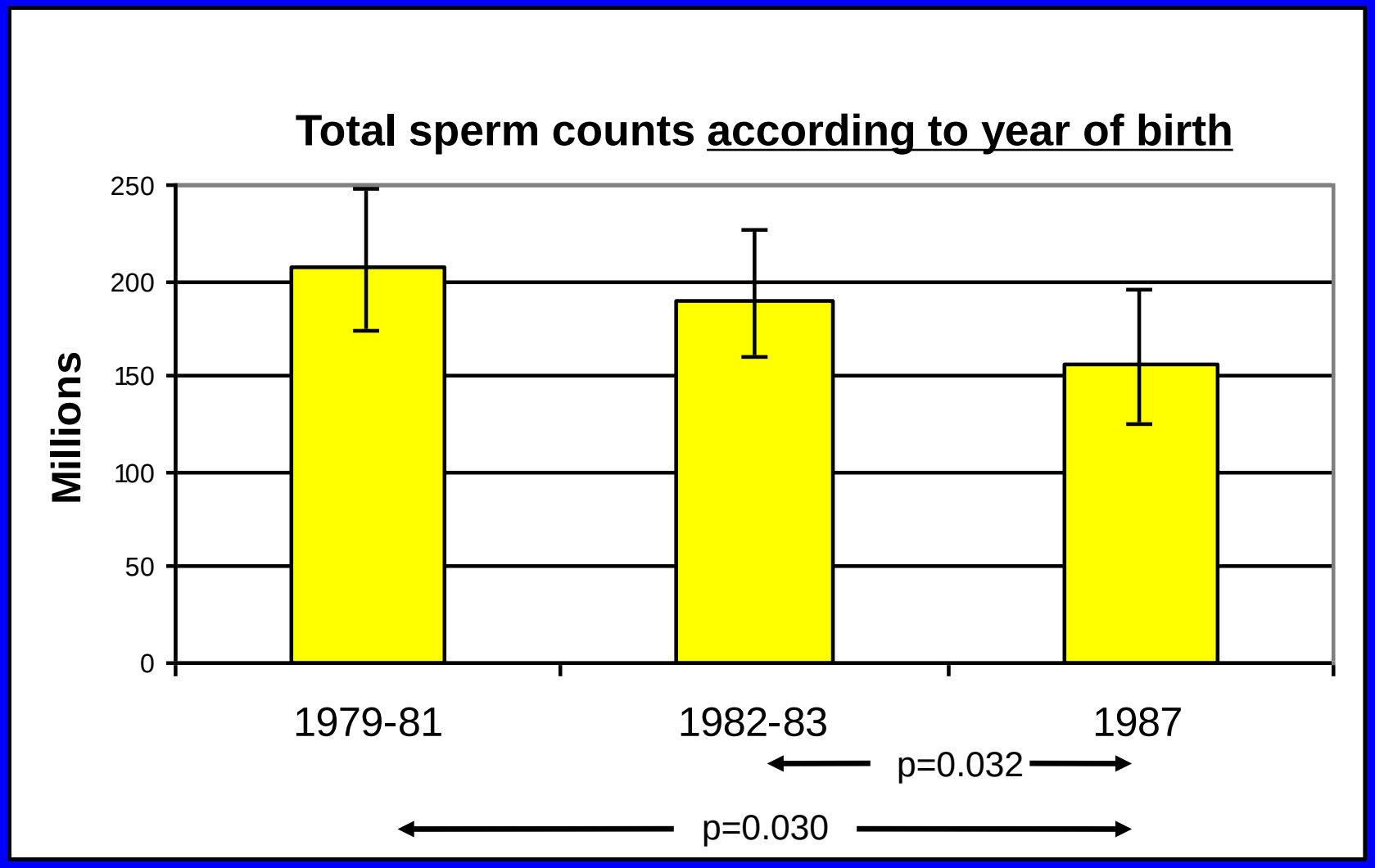
Young men from the Finnish general population



Adjusted for duration of ejaculation abstinence

Jørgensen et al 2011, IJA

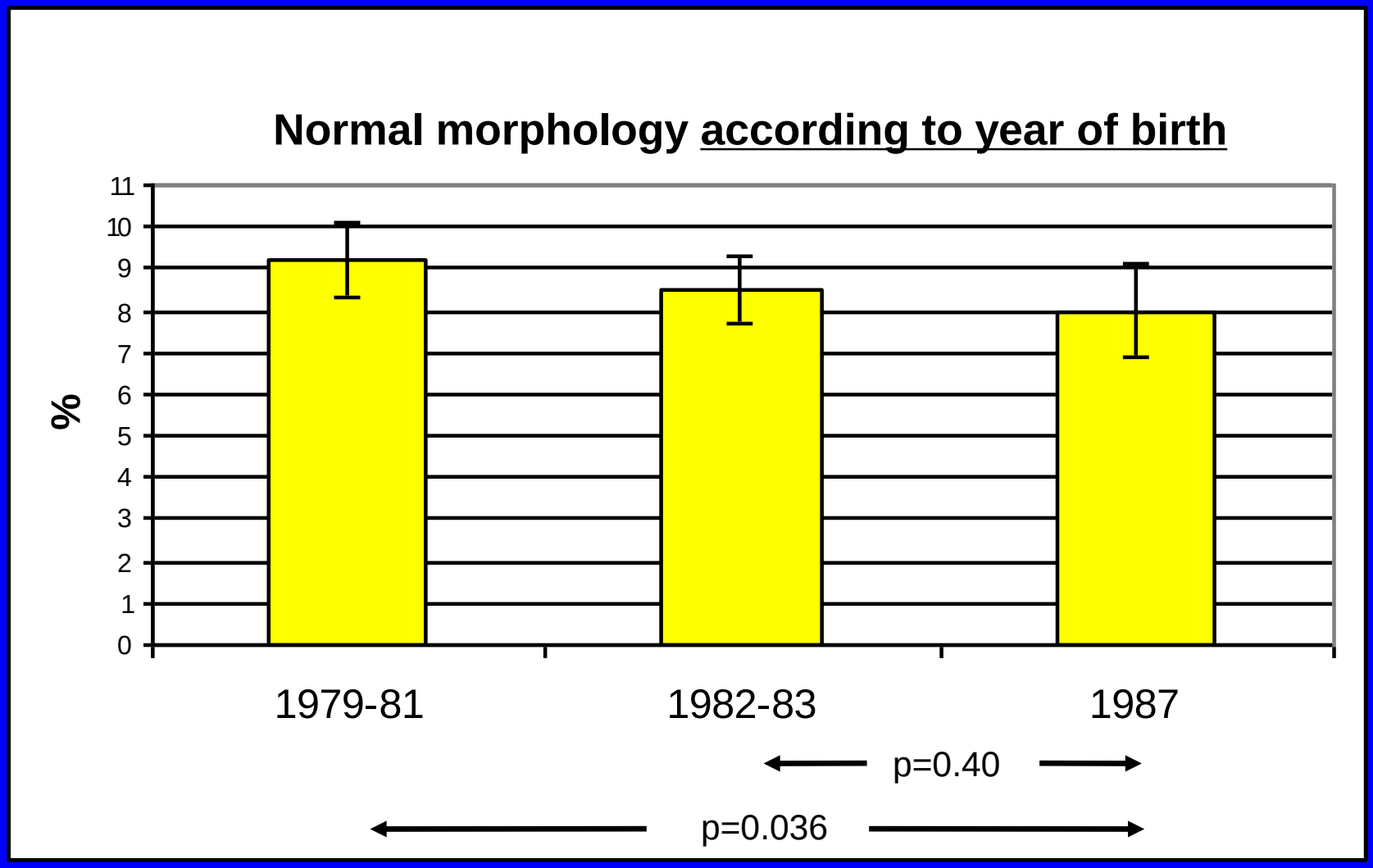
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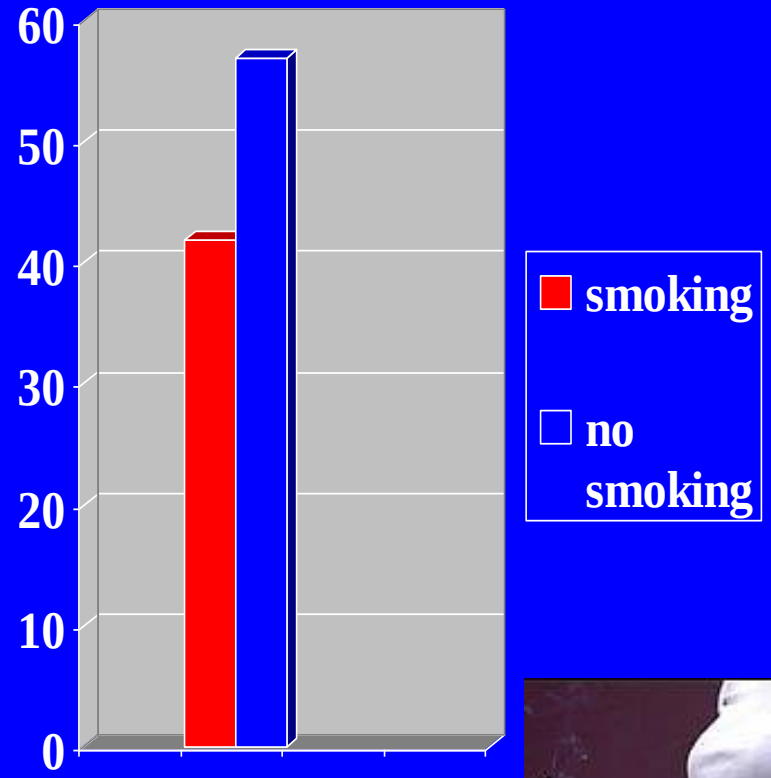
Young men from the Finnish general population



Jørgensen et al 2011

Intrauterine exposure to smoking

- 2069 young men around Baltic sea
- Data on maternal smoking during pregnancy
- Semen analysis

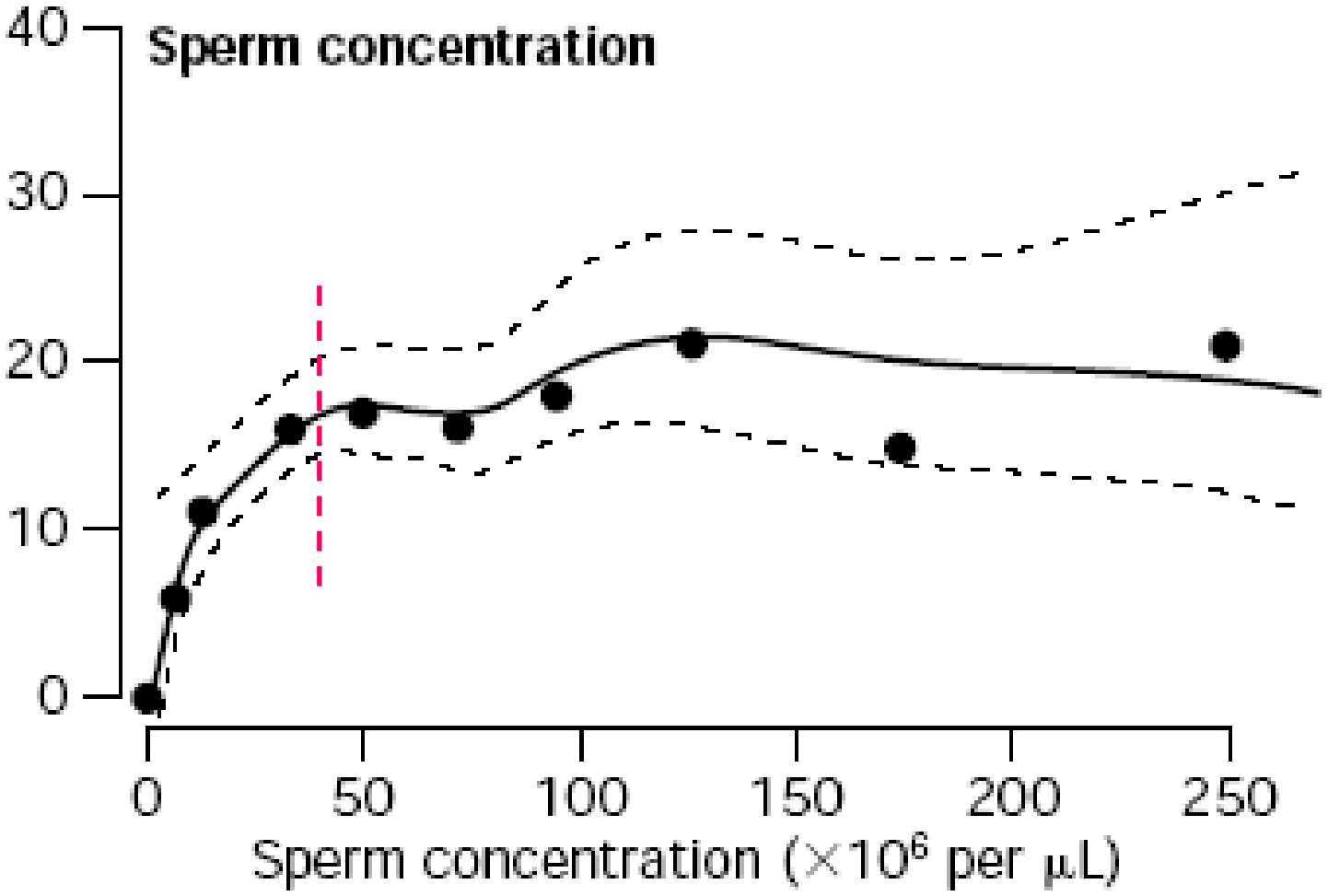


Sperm conc. mill/ml



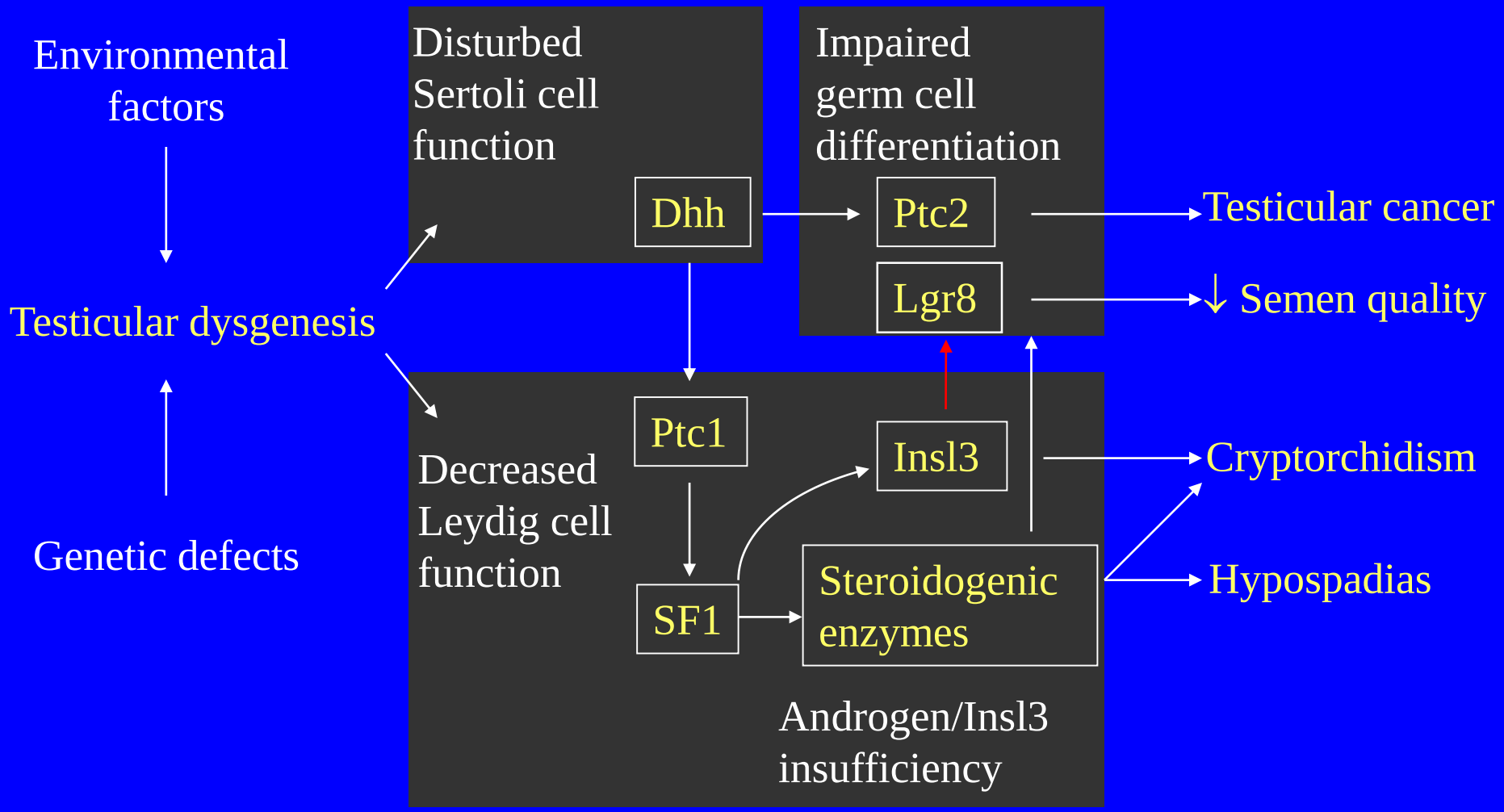
Jensen et al., Am. J. Epid. 2004

Probability of pregnancy/cycle



Bonde et al., Lancet 1998

Testicular Dysgenesis Syndrome



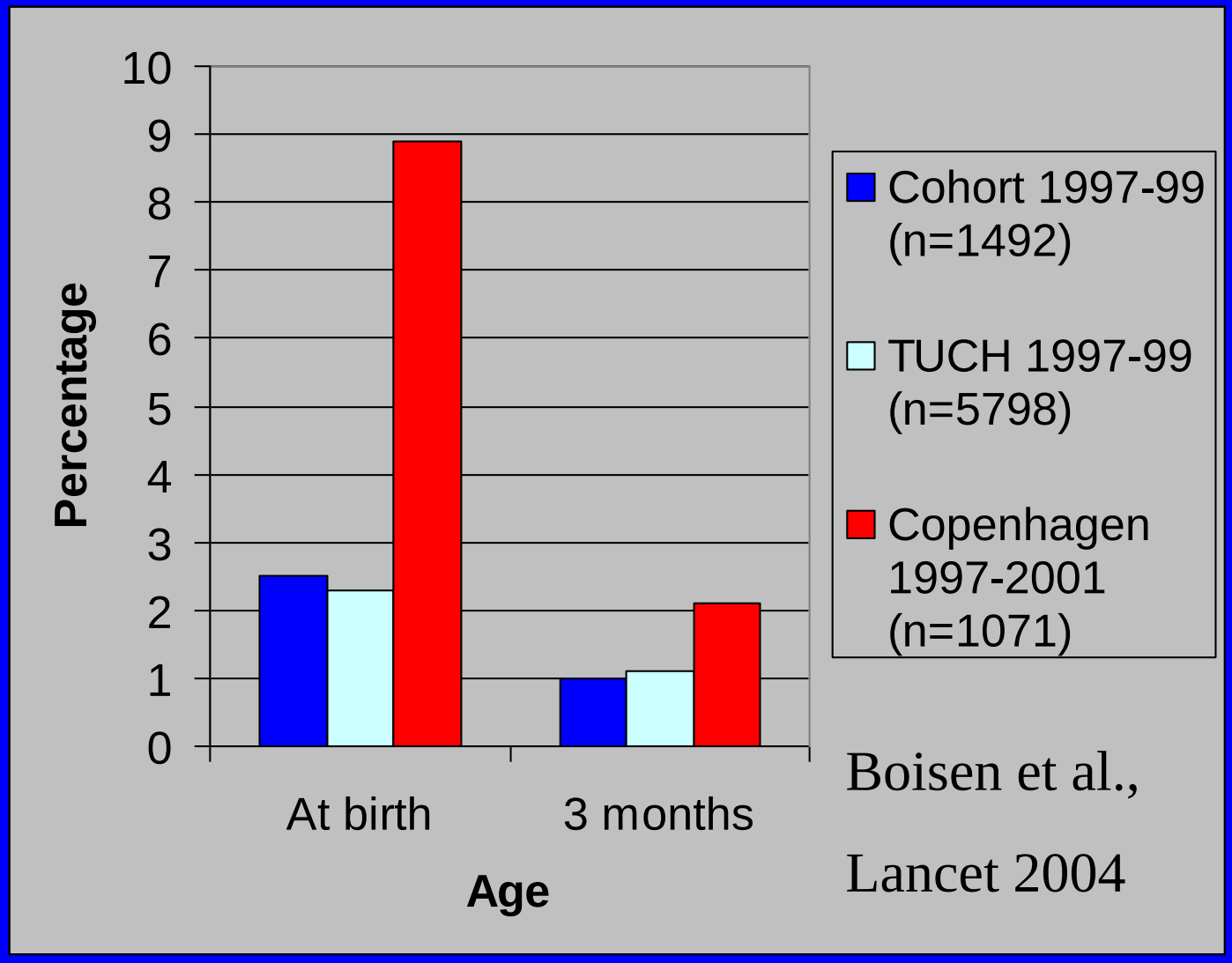
Cryptorchidism

- The most common congenital malformation of newborn boys





Prevalence of cryptorchidism



Boisen et al.,

Lancet 2004