



## Prevention of male infertility

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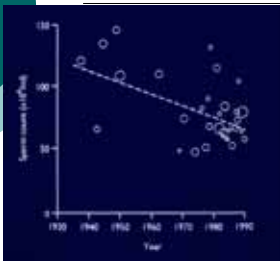
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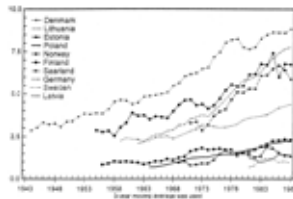
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## Why are we discussing "threat" against male reproductive function



Carlsen *et al*, BMJ 1992



Adami *et al*, Int J Cancer 1994

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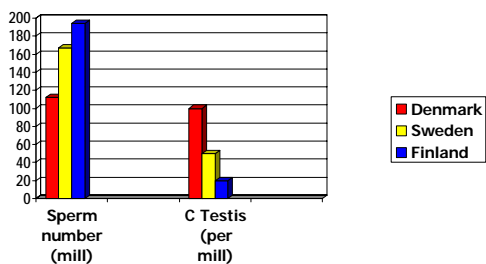
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## Denmark vs. Sweden vs. Finland



Genes, environment, lifestyle?

Richthoff *et al*, Human Reprod 2002

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### What does it mean for

- Scientists?
- Public Health officers?
- Doctors?

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### What do we know about genetics and male fertility?

- Klinefelter syndrome (10-15% of azospermic men);
- Y chromosome microdeletions (2-5% of azospermic men);
- Cystic Fibrosis mutation;
- Kallmann's syndrome

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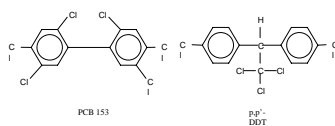
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### What do we know about Environment and male fertility?

Persistent Organohalogen Pollutants  
some of the most potent  
"Endocrine Disrupters"



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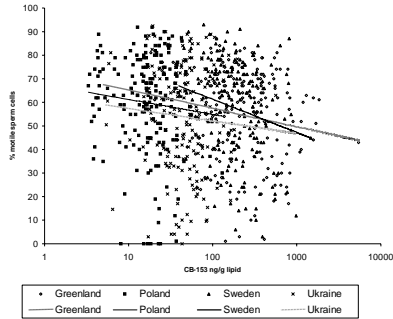
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## CB-153 and sperm motility

Toft *et al*, Epidemiology 2006




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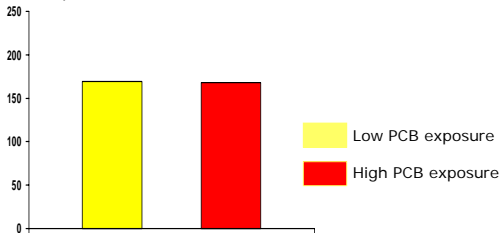
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## No effect of PCB on sperm number

Total sperm number ( $\times 10^6$ )



Toft *et al*, Epidemiology 2006

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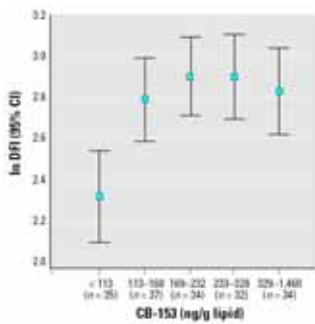
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## POP exposure and sperm DNA integrity



Rignell-Hydbom *et al*, Hum Reprod 2005

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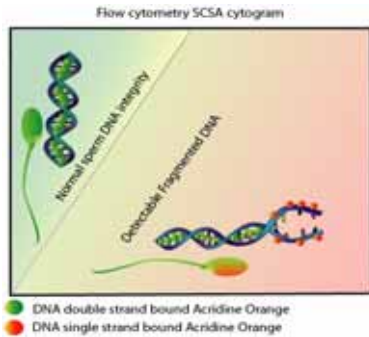
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## Sperm Chromatin Structure Assay (SCSA)




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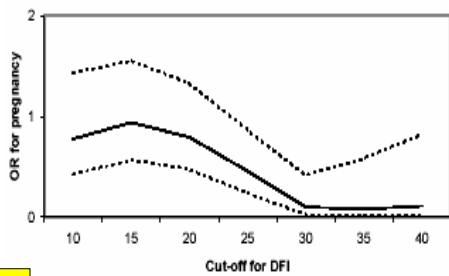
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## Sperm DNA integrity and intrauterine insemination (IUI)



387 IUI

Bungum *et al*, Human Reprod 2007

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## *In vivo* Fertility and semen parameters

- Patients:
  - 134 infertile men (no known causes excl. varicocele);
  - 137 partners of pregnant females
- OR: abnormal (WHO 1999) vs normal sperm parameters: 0.04 (95% CI: 0.02-0.10);
- Normal sperm parameters: DFI no impact on fertility

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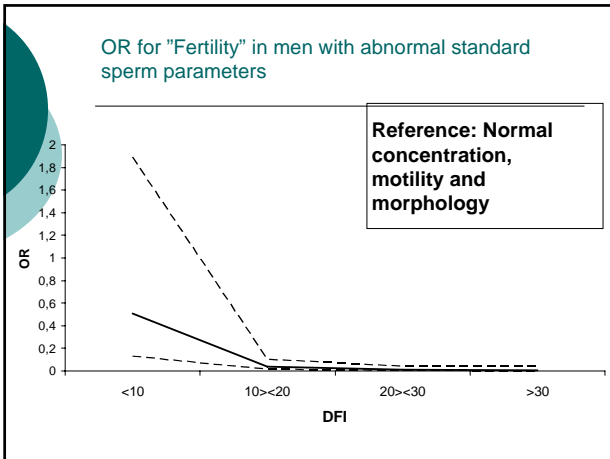
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- ### What do we know about lifestyle and male fertility
- The man:
    - Smoking
    - Body Mass Index
    - Sedentary work position
  - His mother:
    - Smoking
    - Body Mass Index

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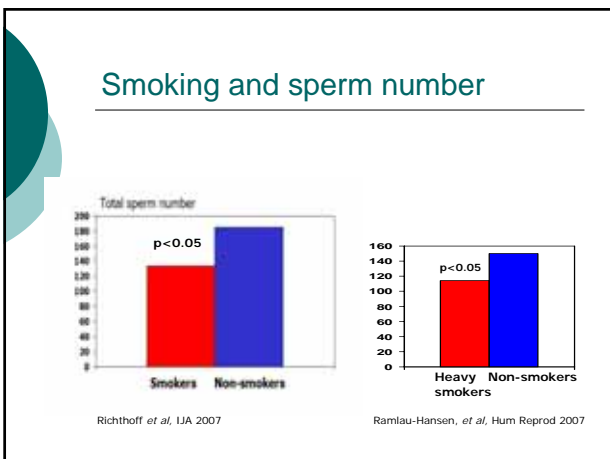
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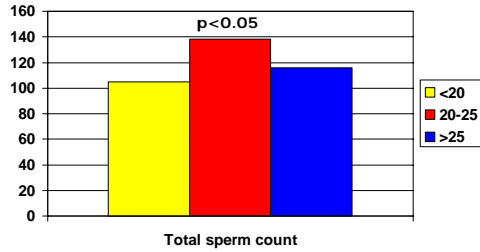
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### Body Mass Index and sperm number



Jensen TK *et al*, Fertil Steril 2004

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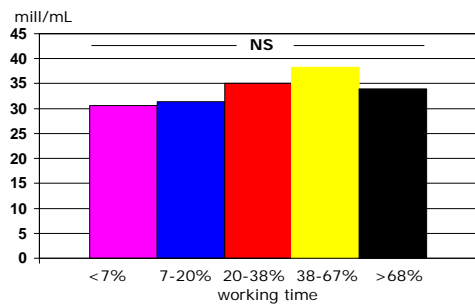
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### Sedentary work position and sperm concentration




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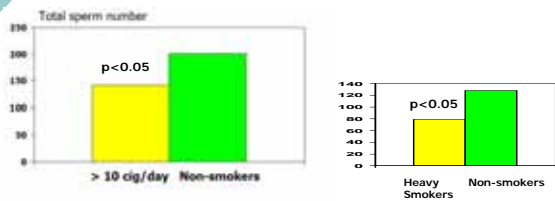
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### Mothers smoking during pregnancy and sperm number



Stogaard *et al*, Epidemiology 2003

Ramlau-Hansen *et al*, Am J Epidemiol 2007

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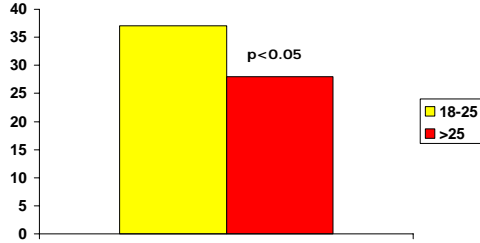
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### Mothers pre-pregnancy BMI and the sperm concentration of their sons



Ramlau-Hansen *et al* Hum Reprod 2007

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### The new challenge:

Can genetical factors predispose to the effects of environment/lifestyle?

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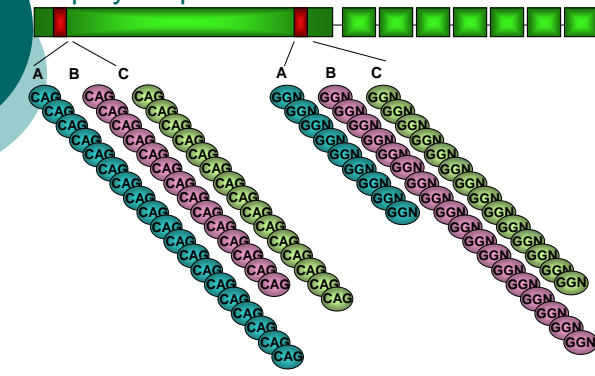
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### The Androgen Receptor gene polymorphisms



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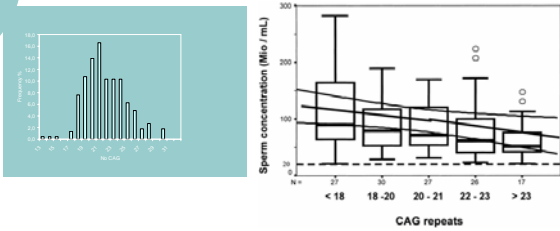
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## Correlation between CAG number and sperm concentration



von Eckardstein *et al.*, JCEM 2001

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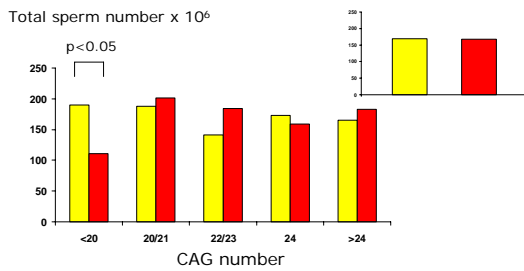
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## Some men might be more susceptible to the effects of environment/lifestyle



Giwerzman *et al.*, Pharmacogenet Genomics 2007

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## What do we advise: As scientists

- o More research needed!

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### What do we advise: As public health workers

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- Stop smoking (men and women);
  
- Normalise body weight (men and women).
  
- Stop environmental pollution!

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### What do we advise: As doctors

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- To the man from infertile couple:
  - Stop smoking?
  - Normalise weight?
  
- To the female wishing to become pregnant:
  - Stop smoking;
  - Normalise weight.

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