Good and bad ways to deal with sex-gender differences in biomarker and biobank research, and issues I would look for as an evaluator of planned studies

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Northern Sweden Health and Disease Study (NSHDS = VIP + MONICA + MA)
An ordinary year:

- 15,000-30,000 individuals’ samples sent for analysis.
- 60-70 papers
- 30-40 new projects
Clinical diagnosis, e.g. kidney failure

Samples from cases

Comparing cases and referents, for ex. toxic metals

Samples from referents (not kidney failure)

Base-line sampling and examination,
Lead and kidney disease

Sommar et al., Environ Health 2013;12:9
Three types of biobank studies

- Risk factors (prevention)
  - Chadeau-Hyam et al., Ann Oncol 2014;

- Early biomarkers (diagnosis)

- Genetic factors (basic science)
Dear Professor Bergdahl,

I found your interesting comments in an article about micro pollutants and gender differences and wanted to ask if you would be interested and able to take part as speaker in one of the panel session at the forthcoming 7th Gender Summit - Europe, which will take place on 5-7th November 2015 in Berlin.

The Gender Summit is a platform for dialogue established in 2011, which brings together scientists, gender scholars and policy makers to jointly examine research evidence showing when, how and why sex/gender impact on quality and efficacy of research.

You can see details of past and forthcoming gender summit at [www.gender-summit.com](http://www.gender-summit.com)

Would you be available on 6th of November to speak about this topic?

kindest regards

Elizabeth Pollitzer
First analysis: What problems do we face in studies of sex-gender differences?
Good or bad way to deal with sex- and gender difference?

Women

Men

Quartiles of E-Pb

Odds-ratio

12.98 - 40.43 µg/L
40.43 - 58.84 µg/L
58.84 - 84.79 µg/L
84.79 - 251.82 µg/L

cases: 15
controls: 64

controls: 39

cases: 13
controls: 23

cases: 9
controls: 27

cases: 27
controls: 54

cases: 24
controls: 57

cases: 12
controls: 50

cases: 3
controls: 33

Quartiles of E-Pb
First analysis: What problems do we face in studies of sex-gender differences?

- Insufficient statistical power (too small studies)
- Sex-gender differences with unknown reasons
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Inconclusive results
Scientific Excellence in Applying Sex- and Gender-Sensitive Methods in Biomedical and Health Research

Linda Nieuwenhoven, M.P.H.,¹,² and Ineke Klinge, Ph.D.¹,³
Nieuwenhoven+ Klinge recommendations, as expressed by me

- Sex/gender relevant?
  - If yes, compare
- Read the literature
- Formulate your hypotheses
- Make sure methods are adequate
- Do the statistics properly
- Report data on sex and gender
- State your conclusions on sex- and gender differences or lack of differences
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Now on our checklist:

- What is known about sex- and gender differences?
- How are such differences to be analysed?
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...and should be added to all evaluators’ checklists?
Two additional comments
Reviews?

- Most reviews include information on sex and gender differences.
- But only when specifically pointed out in the reviewed papers?
- Should not reviews be systematic, weighing the evidence and describe gaps in knowledge?
- Inclusion of systematic review of sex-gender differences in WHO-, Environmental Health Criteria, Efsa opinions, etc? Do these today answer the question ‘What is known about sex-gender differences?’
First analysis: What problems do we face in studies of sex-gender differences?

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Inconclusive results
First analysis: What problems do we face in studies of sex-gender differences?

- Insufficient statistical power (too small studies)
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- Double my study-size funding?
In conclusion

- When evaluating a research proposal, ask:
  - What is known about sex-gender differences?
  - How are such differences to be analysed?

- Reviews: Identify gaps in knowledge on sex-gender differences

- Double my study-size funding?
Thank you for listening!