

The Difference Sex & Gender Make in Health Research

*a presentation for the Centre for Health Evaluation and Outcome Sciences
With thanks to the CIHR Institute for Gender and Health*

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December 2nd, 2015

Centre for Health Evaluation & Outcome Sciences

“we endeavour to influence policy and
transform health care systems”

Sex

- biological construct
- encompasses hormones, genes, anatomy, physiology
- affects prevalence, course and treatment of health conditions and diseases
- differences in drug absorption, body composition, metabolism....

Gender

- social construct
 - roles, identity, relations
- linked to power and to economic and social status
- culturally specific and temporal

Context

“It is the policy of the Government of Canada's Health Portfolio to use sex and gender-based analysis (SGBA) to develop, implement and evaluate the Health Portfolio's research, programs and policies to address the different needs of men and women, boys and girls.”

Interesting examples to drive discovery

every cell is **sexed**

every person is **gendered**

Broader health context

Males have poorer health than females.

They have shorter life expectancies than females.

They are more likely to experience diseases such as autism, skin cancer, liver diseases, respiratory diseases.

Males have higher rates of alcohol use and smoking that increase their risk for health problems.

They are less likely than females to visit health professionals.

An even greater health gap can exist in rural, remote or indigenous communities.

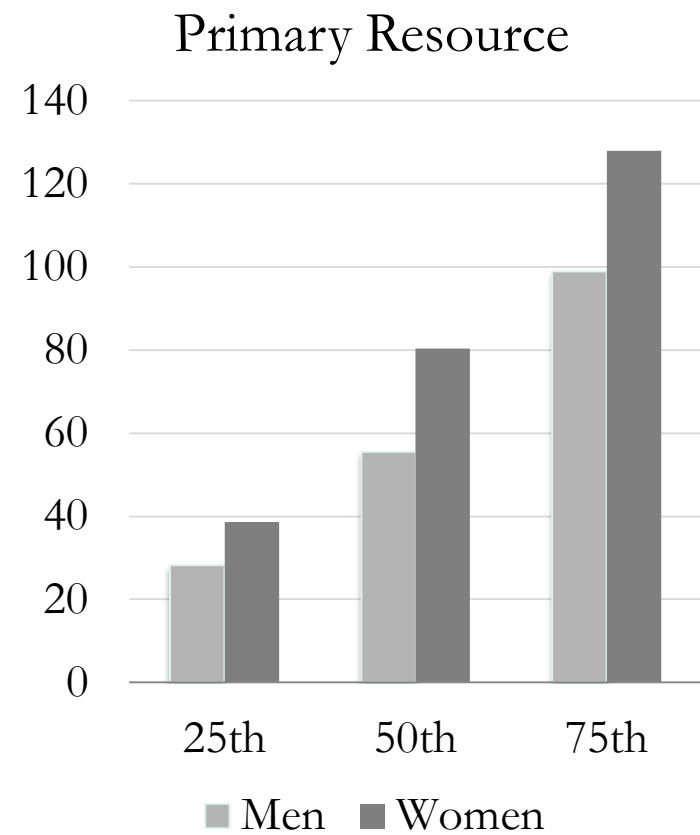
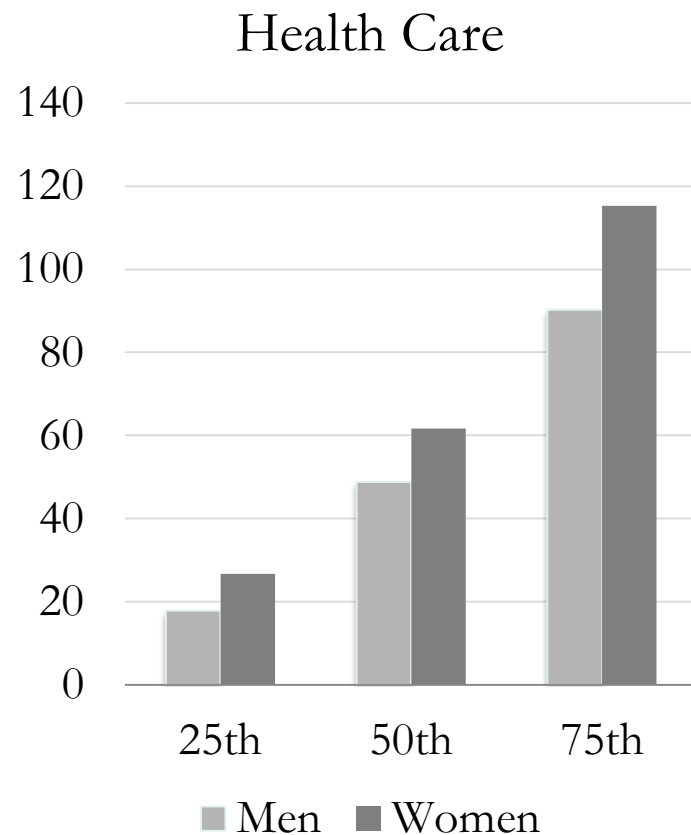
Borkhoff et al. CMAJ 2008;178(6):681-7

- 2 standardized patients with moderate knee osteoarthritis, differed only by sex
- odds of an orthopedic surgeon recommending total knee arthroplasty to a male was 22 times that for a female
- odds of a family physician recommending total knee arthroplasty to a male was 2 times that for a female

Jones, Koehoorn et al. *In Progress*

- workers compensation claims for knee meniscal tear, lumbar disc displacement, rotator cuff tear
- women less likely to receive surgery and median wait time for surgery longer
 - RR for shoulder surgery: 0.46 (95% CI 0.32-0.66)
 - median wait time: 202 versus 170 days

work disability in BC (fractures)



Markle, Danska et al, Gut Microbes 2014;5(4):485-93

“It was completely unexpected to find that the sex of an animal determines aspects of their gut microbe composition, that these microbes affect sex hormone levels, and that the hormones in turn regulate an immune-mediated disease.”

Sorge et al, Nature Neuroscience, 2015;18(8):1081-3

“....researchers interfered with microglia functioning and found that, while pain was blocked in male mice, it had no effect on pain transmission in female mice. An entirely different type of immune cell, the T cell, appears to carry out this function in females.”

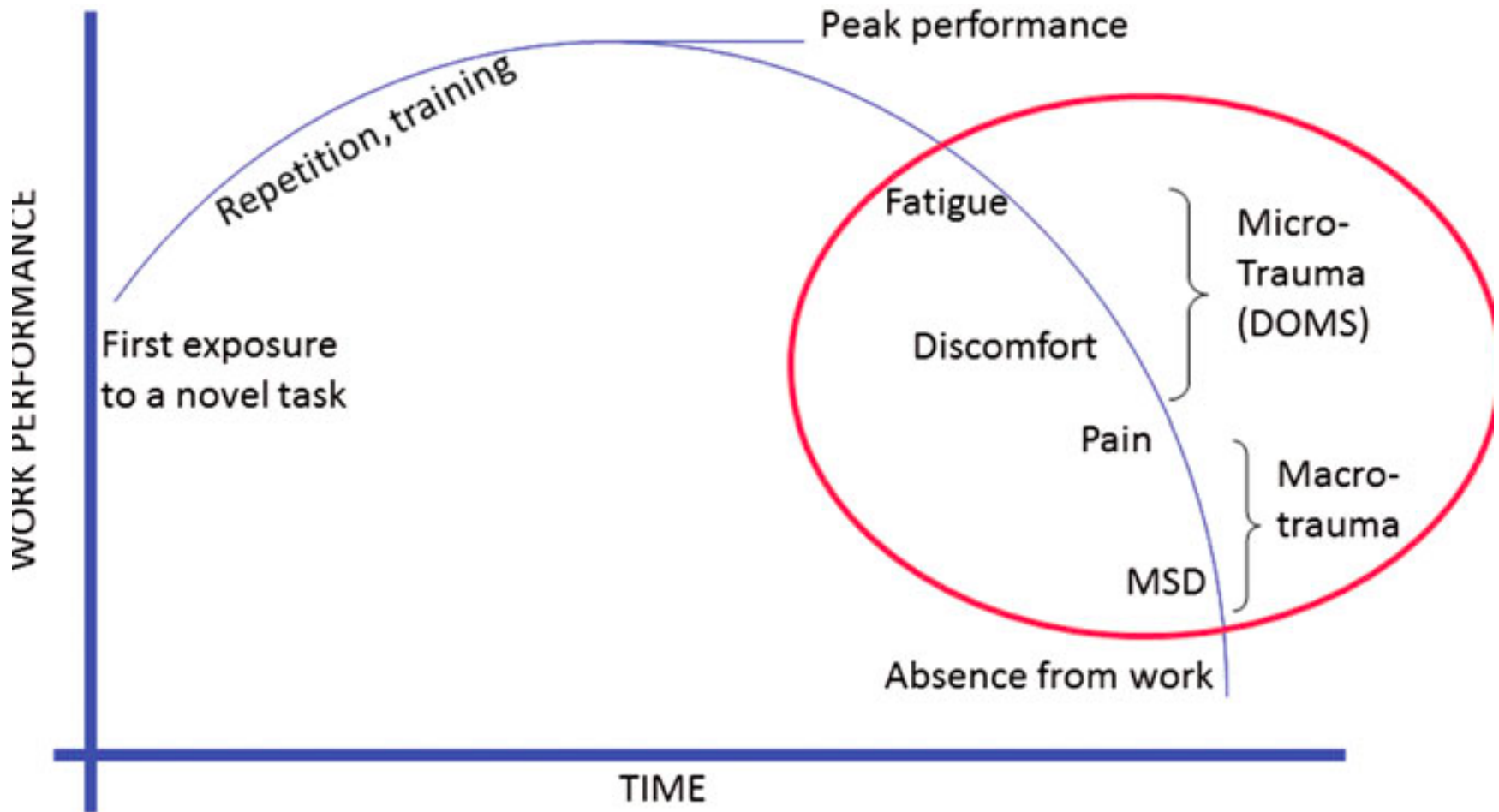
Stem cells

“.....analyzing sex is rare in animal research and rarer still in cell-based research (Beery et al, 2011)”

Muscle-derived stem cells show variability in proliferation and differentiation. Researchers found that XX cells showed a higher regenerative capacity than XY cells.

Physical Differences

Musculoskeletal Injuries/Conditions (*Julie Cote, 2014*)



Fowler et al, CMAJ 2007;177(12):1513-9

- cohort study of 466,792 patients in Ontario
- after adjusting for illness severity:
 - fewer women admitted to ICU than men (39.9% v. 60.1%), especially older women
 - older women less likely to receive mechanical ventilation or pulmonary artery catheterization
 - older women slightly higher risk of death in ICU

Smolina Humphries Morgan et al Circulation 2015;8(6)586-92

- retrospective cohort study, BC
- AMI hospital admissions, survived for 1 year post discharge
- majority of AMI survivors either discontinue treatment or do not refill their prescriptions
- women <55 years are significantly less likely to be on optimal therapy; driven by a sex disparity in treatment initiation and not treatment adherence.

Oliffe et al, Nurse Practitioner, 2015;40(11):50-55

- Men diagnosed with depression at half the rate of women
- longstanding epidemiologic profile inadvertently positions depression as a women's illness
- contribute to men's resistance in seeking professional help for depression and challenge their ability to articulate mental health concerns to clinicians

Sharman and Johnson, Social Science & Medicine 2013;74(11):1812-6

“to create a framework for encouraging researchers to engage in a considered, theoretically sound exploration of difference as it may or may not pertain to their research designs”

A primer: Johnson et al Intl J Equity & Health 2009;8(14)

Case Book: <http://www.cihr-irsc.gc.ca/e/44734.html>

<http://www.cihr-irsc.gc.ca/e/48641.html>