Gender, sex, and OHS:

Gathering data, developing methods, improving health

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Three questions

1. Why do scientists need to think about sex and gender (and other sociodemographic issues) during an investigation of occupational health?
2. What are the consequences of not thinking enough about sex and gender?
3. What could help?

Definitions

What are sex and gender in the context of preventing occupational disease and accidents?

Sex – biological specificities

- Size, proportions, center of mass, strength, hormone-influenced physiology, reproduction (menstrual symptoms, pregnancy, menopause)…

Gender – social roles

- Job, task assignments, work activity, fatigue from work-family incompatibility…

But in practice sex and gender almost always interact, and women's and men's characteristics overlap – to differing extents according to the parameter.

Sex: Reproductive systems

Both women's and men's reproductive systems can be affected by their work

- Men's fertility can be affected by chemical exposures
- Sexual interest can be affected by work schedules, fatigue..
- Menstrual cycle regularity and menstrual pain can be affected by work schedules, chemicals, cold exposure
- Pregnant women can be more sensitive (for example) to musculoskeletal disorders, circulatory problems, and chemical poisoning
- Menopausal symptoms can be affected by the physical and organizational environment
- **Not enough is known about any of these effects**

Why else should occupational health scientists think about **sex specificities**?

Women are not small men

- Different proportions of body segments (centre of mass)
- Different muscle mass and fibre type % (on average)
- Very different weight-lifting capacity (Plamondon 2018)
- Different fatigue responses? Endurance?
- Different proprioception? (J. Côté 2013-19)
- Different reactions to noise? (Lie, Engdahl 2017; Wang, Wang 2021)
- Different pain processing? (Mogil 2020)…

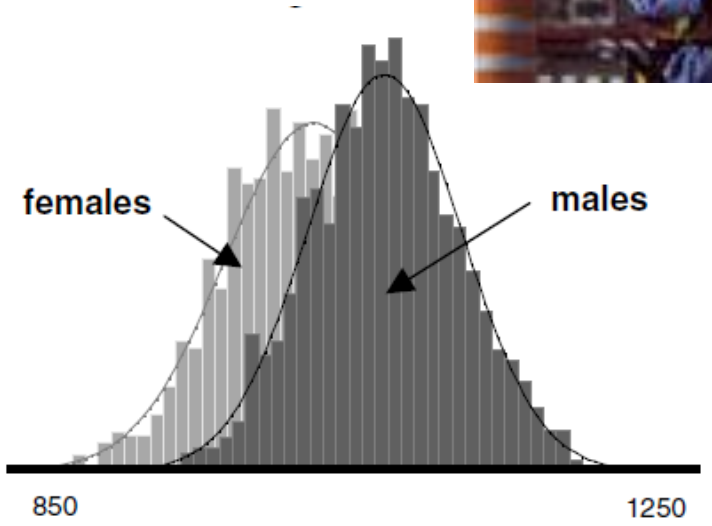
The differences may not be large.

Most do not apply to all individuals.

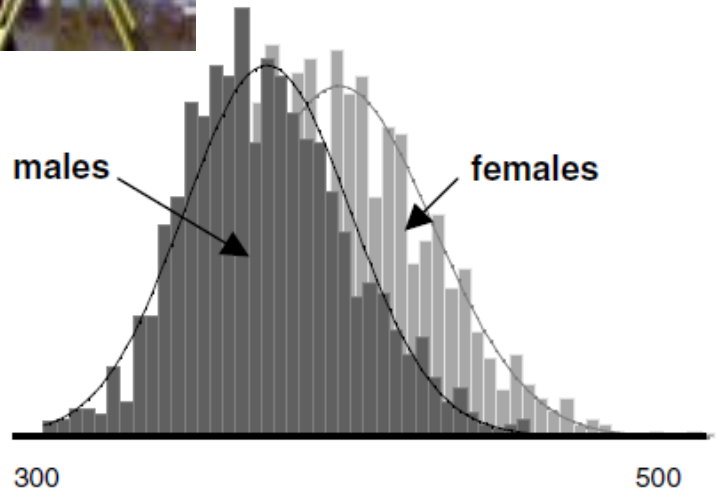
But they may be important for prevention

Equipment is not adapted to female bodies: what happens?

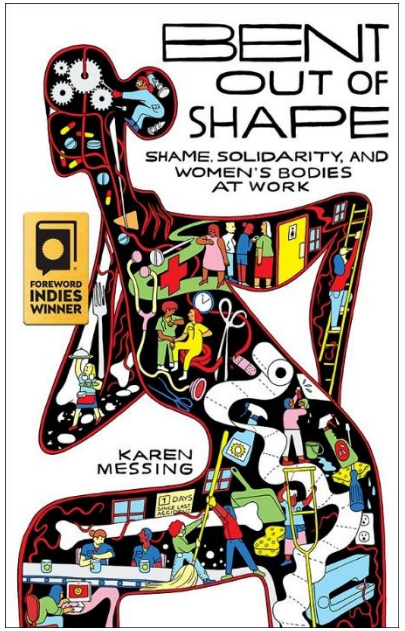
Ouch! My tool belt hurts my hips!



Elbow height (standing)



Hip breadth



See Chapter 5 of *Bent Out of Shape* for details on biological differences and similarities

Source : US Human Factors and Ergonomics Society, Guidelines for Using Anthropometric Data in Product Design

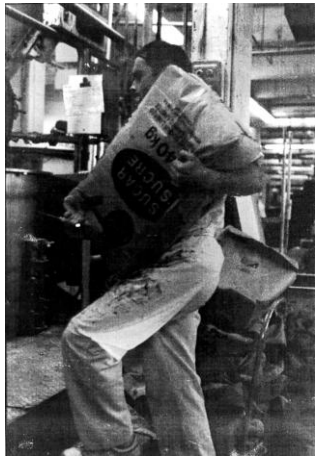
Why should occupational health scientists think about gender?

Women and men have (on average) different jobs, tasks, ways of doing them

Statistically, for women and men to be equally distributed across jobs, more than half of all workers would have to change jobs.

Quebec, Canada, 2021 (Institut de la statistique du Québec)				
Rank	Women	Salary	Men	Salary
1	Early childhood educators	31 000	Truck drivers	42 800
2	Administrative assistants	38 040	Senior managers	87 000
3	Nurses' aides	37 280	Sales staff	40 400
4	Nurses	72 000	Carpenters	49 200
5	Office manager	48 520	Sales managers	52 400
6	Primary,preschool teachers	59 900	Manual handlers	40 400
7	Sales staff	29 880	Mechanics	48 400
8	Cleaners – light work	21 620	Construction helpers	40 400
9	Customer service staff	37 600	Cleaners – light work	32 000
10	Accounting clerks	40 360	Information tech	85 000
Average	**72.2% women**	**41 620**	**75.9% men**	**51 800**

OHS problems: prevalence sometimes higher among women, sometimes men



Higher for men :

- accidents in general (55%), fatalities (91%)
- many toxic exposures
- noise exposure

Higher for women:

- accidents in non-traditional jobs (2-3x)
- some toxic exposures (nail salons, hospitals…)
- non-traumatic MSDs (1.5x)
- many psychological risks, sexist and sexual harassment

Higher risk of COVID for health care and service workers, mostly women

- Higher risk of seroprevalence for women (1.2x), racialized (2.3x); and lower-paid health care workers (O.R. = 0.9 for MDs,, 1.3 nurses, 2.3 nurses' aides, 3.4 cleaners)

Gender: Work activity differences within the same job title

Job observed	Women	Men
Food servers (same restaurant)	• 38 steps/min • walk 27% of time	• 21 steps/min • walk 15% of time

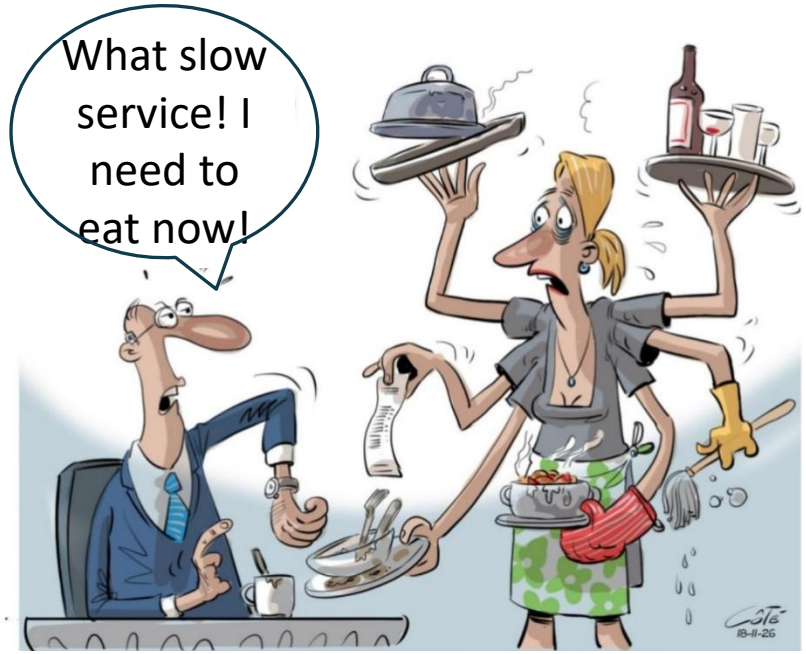
3.2x difference in number of steps. So it's not just stride length difference (about 10%). Sex/gender- based strategies?

Sources : Laperrière et al. 2006; Calvet et al. 2012

Different task assignments

« Housekeeping » for women

Different performance requirements



Ill-adapted conditions: How many plates fit on one arm?

2. Obstacles to taking sex and gender into account

Lack of knowledge: Exclusion of women from studies because of hormonal differences or prejudices or not knowing how to treat data

Studies of industrial cancers still focus on men

Among 243 studies of occupational lung cancer, men-only studies were 19 times more frequent than women-only studies, and 35% more common than mixed studies*

35% of studies of gender-mixed exposed populations excluded women from their sample

44% of studies of gender-integrated jobs excluded women

Source: Betansedi et al. AJIM 2018

Similar problems with cardiovascular outcomes (Messing & Dautel, 2025), toxicity (Mergler 2012)

Creates a vicious cycle maintaining invisibility of women's risks

Scientific consequences
Example: « standing »?

Walking

Pacing

Standing still

Leaning

Stretching

Carrying

Bending…

Who is exposed to static standing?

Working posture among those who stand	Women N=2358	Men N=3201
Fixed position	14%	11%
Move a little	34%	28%
Move a lot	33%	44%

*$p < 0.001$ for the M/F difference, χ^2 test
Tissot et al. 1998

Consequences of adjusting for gender with respect to working posture

In studies of cardiovascular effects,

- Static standing conflated with walking
- Analyses « adjusted for gender »

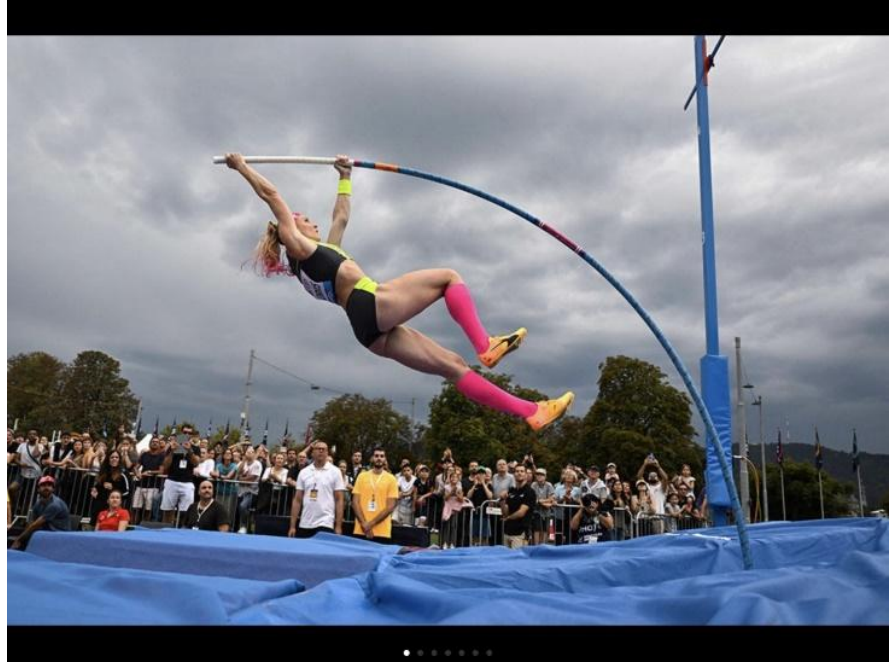
= adjusted for unmeasured difference in moving

Results in

- Failure to recognize cardiovascular effects of prolonged static standing **for women and men** in epidemiologic studies (although shown in laboratory studies)
- Suggesting standing desks for seated workers – an error
- (In North America, but increasingly in Europe) exposure of service workers to prolonged static standing

The same argument applies to adjustment for social class, since prolonged static standing is associated with low pay.

Other examples of why forgetting gender is bad for science



- Misunderstanding or failure to think about the work/family interface as part of OHS
- Standard to use for detection of mercury toxicity in urine of women (2001 cf 2017) (in 2020 women still excluded from studies)…
- Inappropriate training for jobs handling weights (inanimate and people)
- Design of boots for workers who climb utility pôles….

Also see *Invisible Women* by Caroline Criado Perez

Obstacles to identifying gender as an issue when considering exposures

- Fear that management or male workers will feel accused of sexism and get angry
- Lack of time to discuss such complicated issues
- Employers and unions have other urgent priorities that can be tackled without a lot of internal dissension
- A (reality-based) sense that men are more exposed to visible, scary dangers and obviously unpleasant conditions – e.g. personal support workers

What could help?

Can the obstacles be overcome?

An ergonomics project that sort of worked

Personal support workers (feed, bathe, move patients)

Originally separate jobs by sex, but merged by law

In health and safety sessions, both women and men said the merger was bad, that men were overworked

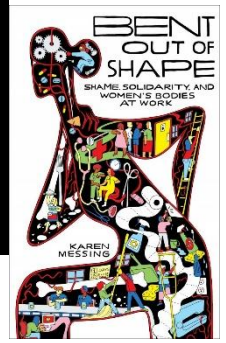
The union asked for a study.

Hospital management said we couldn’t study sex/gender, but could study « ergonomics » (>100h of observations)

Surprise! Women were doing **more** physically demanding operations per hour

	Women	Men
Operations done alone	381 (61.2%)	265 (48.5%)
All operations	623	546
Physically demanding/hr	22.3	16.5

Bent Out of Shape, chapter 2



But…

During the 100+ hours of observation, men (only) were called on to do some extreme operations: controling an angry or psychotic patient, catching an obese patient who was falling from his chair.

So the concern with men was also valid.

Was male gender being used as a justification for exposing men to extra risk from overstrain?

Was female gender being used as a justification for exposing women to extra risk from overwork?

Messing and Elabidi, 2003; Chadoin et al. 2014

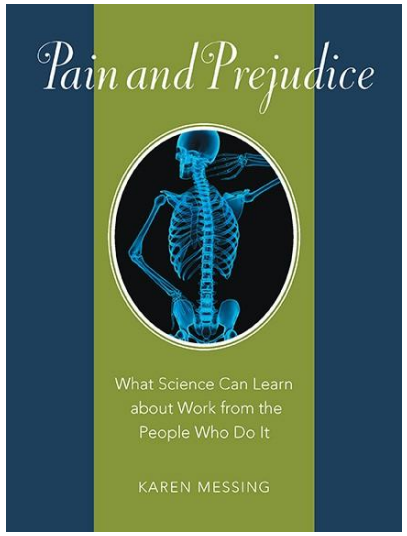
What could help?
Towards solutions…

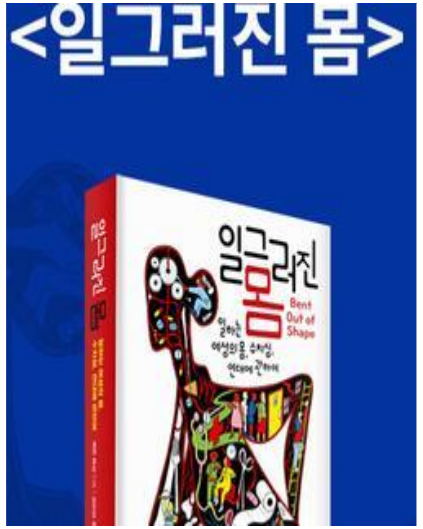
- Teamwork – Julie Dussault, a graduate student, suggested assigning PSWs in pairs to a group of rooms (better if the teams are stable). This worked and made everyone happier.
- Teams are not a group of identical ideal individuals but a meld of complementary talents.
- More generally, think about inclusive tools, equipment, practices

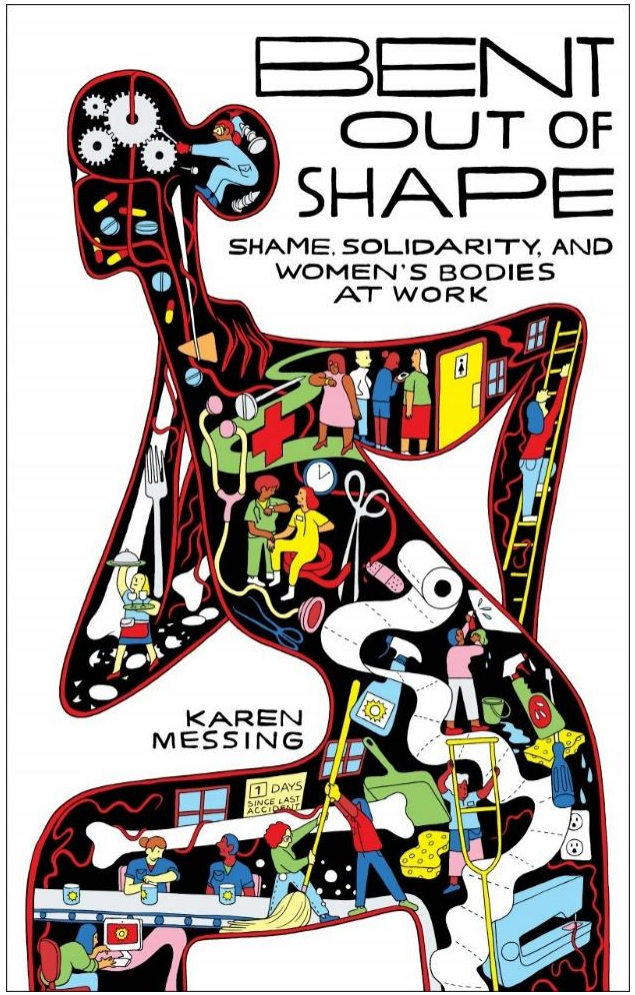
The original three questions

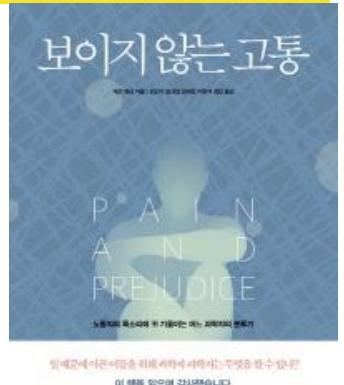
1. Why do scientists and practitioners need to think about sex and gender (and other sociodemographic issues) during an investigation? To get accurate and complete data, influence worksite design, promote health
2. What are the obstacles to including gender in investigations and practice? Lack of information, lack of scientific tools, lack of attention, reluctance to cause trouble….
3. What could help? Thinking about teamwork, thinking about inclusion, thinking about quantitative techniques to take account of gender, racialization, class, etc., simultaneously (Lederer et al. IJERPH 2022)

Questions? Comments?









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