



# Gender in research webinar

Health, demographic change and wellbeing

15 October 2018

**GENDER  
ACTION**



YELLOW WINDOW



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**GENDER  
ACTION**



  
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# Basic Concepts

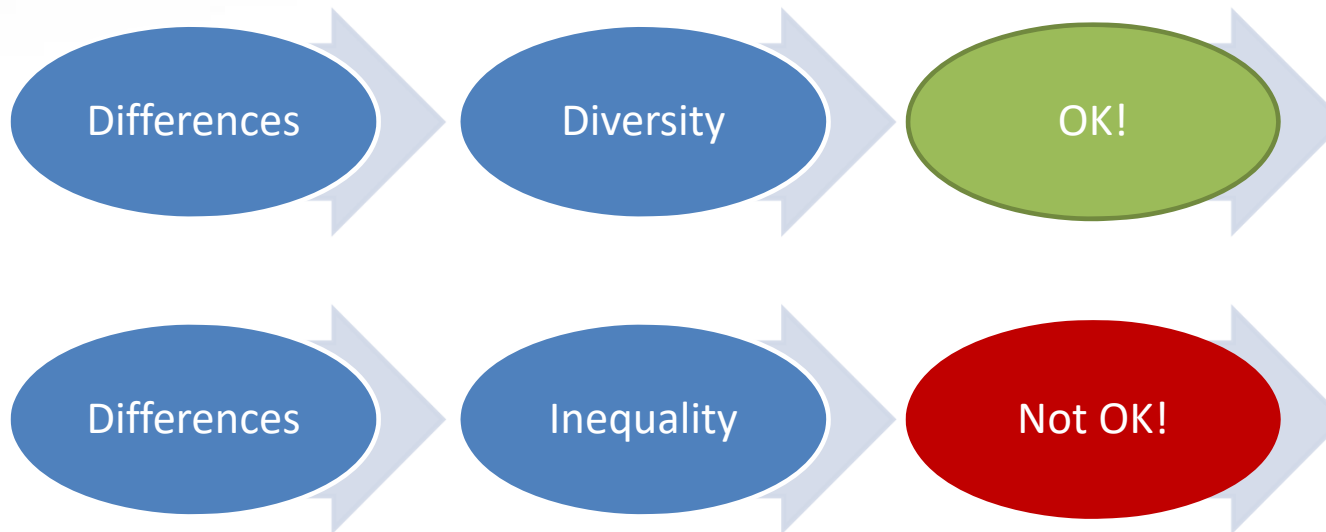
**SEX** refers to the biologically determined characteristics of men and women in terms of reproductive organs and functions based on chromosomal complement and physiology. As such, sex is globally understood as the classification of living things as male or female.

**GENDER** refers to the social construction of women and men, of femininity and masculinity, which varies in time and place, and between cultures.



## NOTE THAT:

- The problem is not the difference between men and women as such, but the difference in how they are valued
- Certain aspects associated with 'masculinity' still tend to be valued more highly
- The result is inequality of opportunities, segregation & discrimination



## GENDER EQUALITY

A situation where individuals of both sexes are free to develop their personal abilities and make choices without the limitations imposed by strict gender roles. The (possibly) different behaviours, aspirations and needs of women and men are considered, valued and favoured equally.



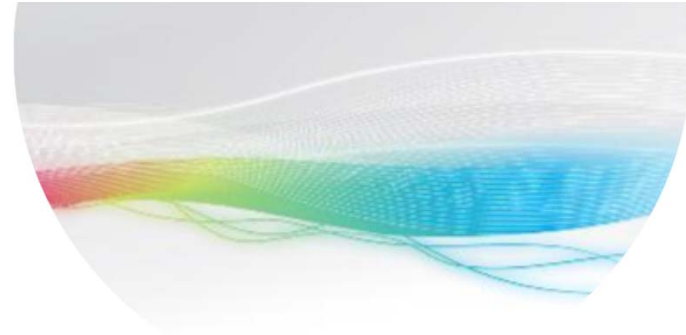


European  
Commission



HORIZON 2020

# European Commission



Three objectives underpin the European Commission's strategy on gender equality in research and innovation policy:

- *Fostering equality in scientific careers*
- *Ensuring gender balance in decision-making processes and bodies*
- *Integrating the gender dimension in research and innovation content, i.e. taking into account the biological characteristics and the social features of women and men*



Equal  
Opportunities  
in research at  
all levels



Gender and  
sex variable in  
the research  
content

Gender  
in  
research



Equal  
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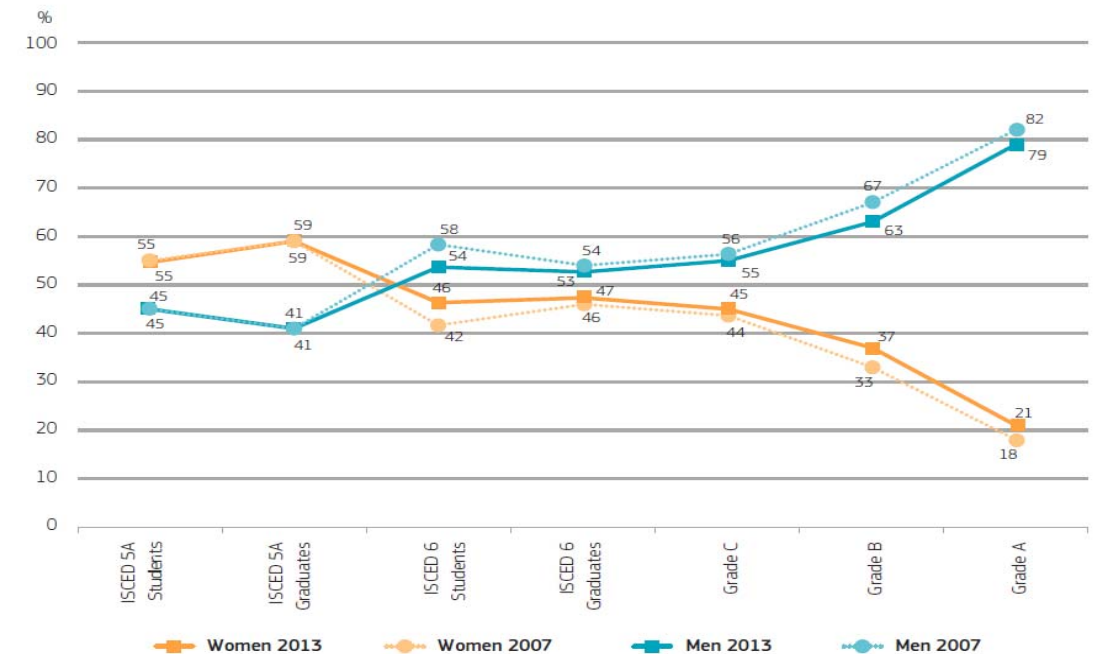
Gender and  
sex variable in  
the research  
content

Gender in  
research

# SHE – figures – 2015: The scissors - diagram

- In only eight out of 28 EU Member States did women account for more than 40 % of researchers.
- Women in the EU have a stronger presence amongst researchers in the higher education and government sectors. In the business enterprise sector, they make up close to one in five researchers (2011).”

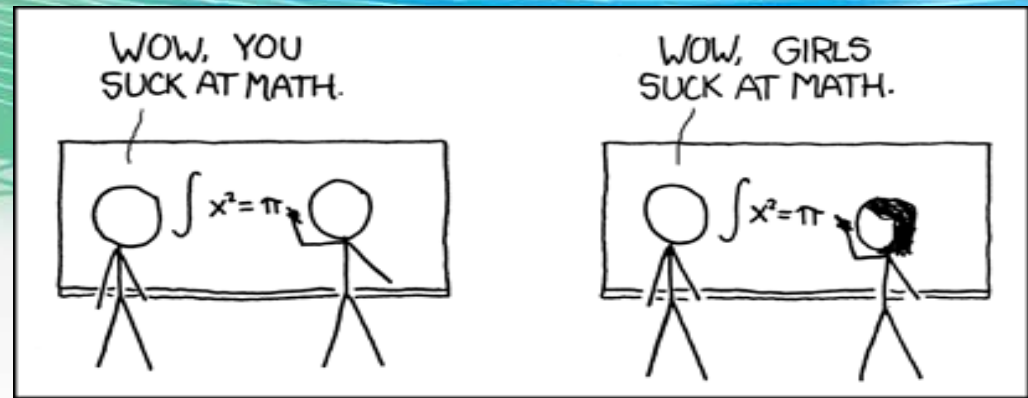
**Figure 6.1.** Proportion of women and men in a typical academic career, students and academic staff, EU-28, 2007–2013



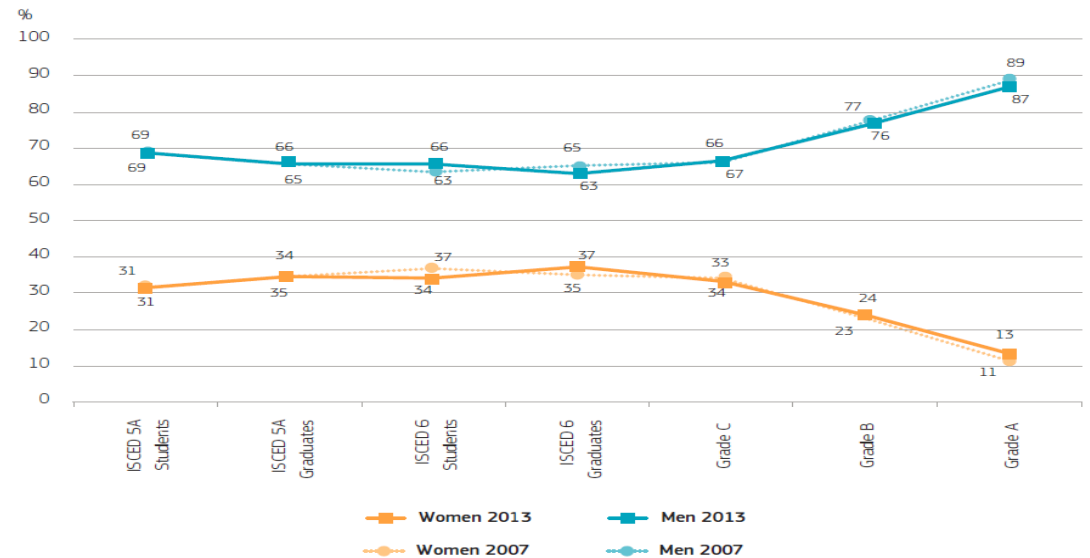
Notes: Reference years Eurostat data: 2007–2012; Reference years for Women in Science (WIS) data: 2007–2013; Exceptions to the reference years (WIS): AT: 2007–2011; BE (FR), LV, RO: 2010–2013; CY, PT: 2007–2012; DK, LU (Grade A and B, C not available): 2009–2013; ES, IE: 2008–2012; BE (FL), NL, FI: 2011–2013; PL, SK: 2012–2013; FR: 2012; HR: 2014; MT: 2015; EE: 2004 (She Figures 2012); LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: (Eurostat) ISCED 5A Students: LU (2007); ISCED 5A Graduates: FR (2012), LU (2007); ISCED 6 Students: DE (2007), LU (2007); ISCED 6 Graduates: FR (2012), LU (2007).

Source: Women in Science database, DG Research and Innovation and Eurostat – Education Statistics (online data code: educ\_grad5)

The gap is even bigger if we look at the proportion of women and men in the areas of science and engineering.



**Figure 6.2.** Proportions of women and men in a typical academic career in science and engineering, students and academic staff, EU-28, 2007–2013



Notes: Reference year for Eurostat data: 2007–2012; Reference year for WIS data: 2007–2013; Exceptions to the reference years (WIS): AT: 2007–2011; BE (FR): 2010–2013; BE (FL), NL, FI: 2011–2013; CZ: 2007–2008; DK: 2009–2013; IE: 2008–2012; CY, PT: 2007–2012; EL, MK: 2012; PL, SK: 2012–2013; BA, SI: 2013; HR: 2014; LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: WIS Grade A, B and C: AT, BG, EE, FR, HU, LU, LV, RO; Eurostat: ISCED 5A Students: LU (2007), ISCED 5A Graduates: FR (2012), LU (2007), ISCED 6 Students: DE (2007), LU (2007), NL (2007), ISCED 6 Graduates: FR (2012), IT (2007), LU (2007), PL (2012); Others: SET fields of education = Science, maths and computing + Engineering, manufacturing and construction; SET fields of science = Engineering and technology + Natural sciences.

Source: Women in Science database, DG Research and Innovation and Eurostat – Education Statistics (online data code: educ\_grad5)



# Gender Equality Plan

As defined by the European Commission, a gender equality plan consists of a set of actions aiming at:

- Conducting impact assessment / audits of procedures and practices to identify gender bias.
- Identifying and implementing innovative strategies to correct any bias.
- Setting targets and monitoring progress via indicators.



European Commission Communication  
on 'A Reinforced European Research Area  
Partnership for Excellence and Growth' (COM(2012) 392 final)

## Good practice examples - Areas of intervention:

- Organisational culture:
  - ✓ Organise gender training
- Reconciliation of work and private life:
  - ✓ Measures to facilitate return to work after parental leave
- Recruitment, selection and career progression:
  - ✓ Organise unconscious bias awareness sessions
- Leadership and decision-making:
  - ✓ Gender quota in all decision making bodies
- Sexual and gender-based harassment:
  - ✓ 'Special Contact Person' for sexual harassment



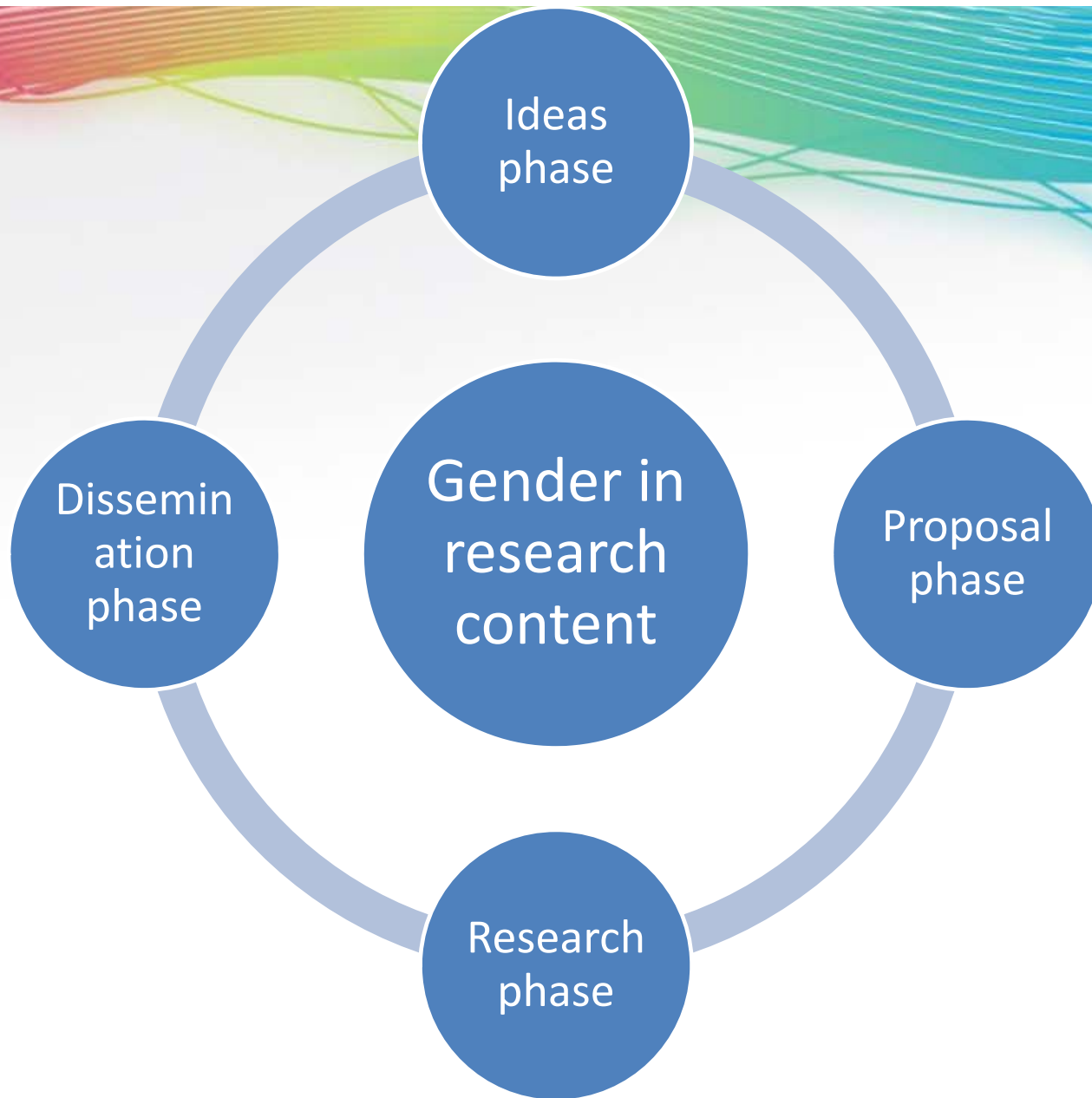
→ See GEAR tool:  
<http://eige.europa.eu/gender-mainstreaming/toolkits/gear>

Equal  
Opportunities  
in research at  
all levels



Gender and  
sex variable in  
the research  
content

Gender  
in  
research



**Remember:  
Both the variables  
sex AND gender can  
be relevant**

# Integrating sex / gender in a H2020 proposal

- Make 'gender' visible straight away (e.g. in abstract, key words)
- Budget: foresee resources; remember gender training is an eligible cost (budget for training under 'other direct costs')
- Keep 'gender' in mind throughout the proposal preparation and drafting (gender balance in team; management structures; expertise in the consortium; research activities;...)

→ *No 'magic formula' or couple of paragraphs*

→ *No 'excellence' without gender equality!*

→ *Mobilise expertise*



# Integrating sex / gender in a H2020 proposal

## Technical part of the proposal:

### 1. Excellence:

1.1: Objectives: point out relevance; include analysis of sex / gender in relation to the main research topic as objective; explain which knowledge exists already and which are the gaps the research will fill

1.2 Relation to the Work Programme: especially when gender is flagged → explain how furthering gender knowledge will help advance the WP objectives

### 1.3 Concept and Method:

a) Explain / show the gender expertise in the consortium (interdisciplinary research!), and if missing, say how this will be solved. Refer to existing research on sex/gender in relation to the topic and explain how the project will build on the existing research (if relevant)

b) Explain the project's approach to sex / gender throughout the research cycle

1.4 Ambition: include also a reflection on what the ambition of the project is in relation to gender knowledge

# Integrating sex / gender in a H2020 proposal

## Technical part of the proposal:

### 2. Impact:

2.1 Expected impacts: include gender! Point out any obstacles or barriers, e.g. missing sex-disaggregated data → explain how the project will contribute to solving this obstacle

### 2.2 Maximise impact

- a) dissemination and exploitation: be consistent and integrate also sex/gender findings in how exploitation is planned; show what the added value will be; how including sex/gender variable will raise the quality of the research
- b) communication: communicate findings! (conference papers; posters; research articles); show how results will be disseminated in a way that makes the sex/gender variable visible

# Integrating sex / gender in a H2020 proposal

## Technical part of the proposal:

### 3. Implementation

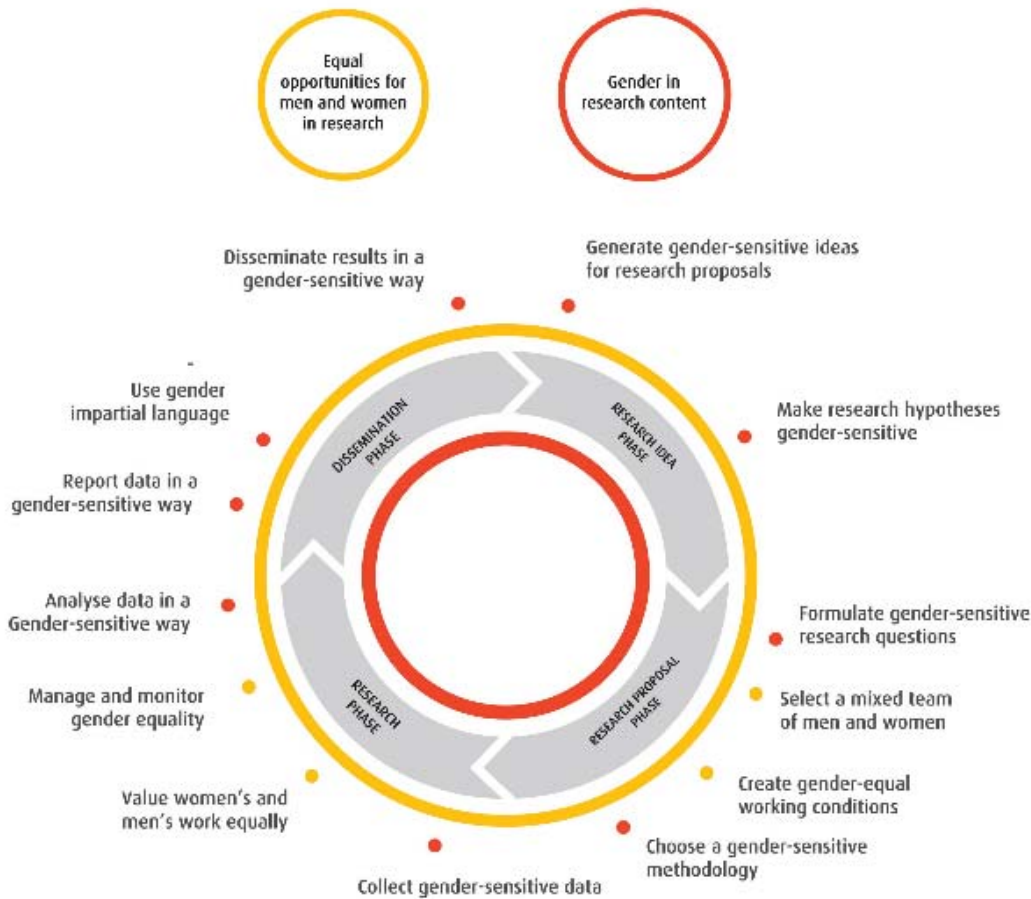
3.1: Work Plan: WP's and deliverables: integrate sex / gender throughout; show how the variables sex and/or gender will be taken on board; involve/consult relevant stakeholder groups and experts; consider separate deliverable on gender issues; present Gender Equality Plan in Management work package

3.2 Management structures: ensure gender balance in management structures!

3.3 Consortium as a whole: ensure and point out gender balance and gender expertise

3.4 Resources: gender training to be foreseen; sufficient resources for gender issues in the work plan

# Tool: checklist, in <https://www.yellowwindow.com/genderinresearch>



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## How to make research gender-sensitive

### CHECKLIST FOR GENDER IN RESEARCH

#### Equal opportunities for women and men in research

- Is there a gender balance in the project consortium and team, at all levels and in decision-making positions?
- Do working conditions allow all members of staff to combine work and family life in a satisfactory manner?
- Are there mechanisms in place to manage and monitor gender equality aspects, e.g. workforce statistics, as required by FP7?

#### Gender in research content

##### Research ideas phase:

- If the research involves humans as research objects, has the relevance of gender to the research topic been analysed?
- If the research does not directly involve humans, are the possibly differentiated relations of men and women to the research subject sufficiently clear?
- Have you reviewed literature and other sources relating to gender differences in the research field?

##### Proposal phase:

- Does the methodology ensure that (possible) gender differences will be investigated: that sex/gender-differentiated data will be collected and analysed throughout the research cycle and will be part of the final publication?
- Does the proposal explicitly and comprehensively explain how gender issues will be handled (e.g. in a specific work package)?
- Have possibly differentiated outcomes and impacts of the research on women and men been considered?

##### Research phase:

- Are questionnaires, surveys, focus groups, etc. designed to unravel potentially relevant sex and/or gender differences in your data?
- Are the groups involved in the project (e.g. samples, testing groups) gender-balanced? Is data analysed according to the sex variable? Are other relevant variables analysed with respect to sex?

##### Dissemination phase:

- Do analyses present statistics, tables, figures and descriptions that focus on the relevant gender differences that came up in the course of the project?
- Are institutions, departments and journals that focus on gender included among the target outlets for dissemination, along with mainstream research magazines?



**GENDER  
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Prof. Dr. Vera Regitz-Zagrosek

Gender in health research



# Gender in research webinar

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15 October 2018

Prof. Dr. Vera Regitz-Zagrosek

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# The topics of the call

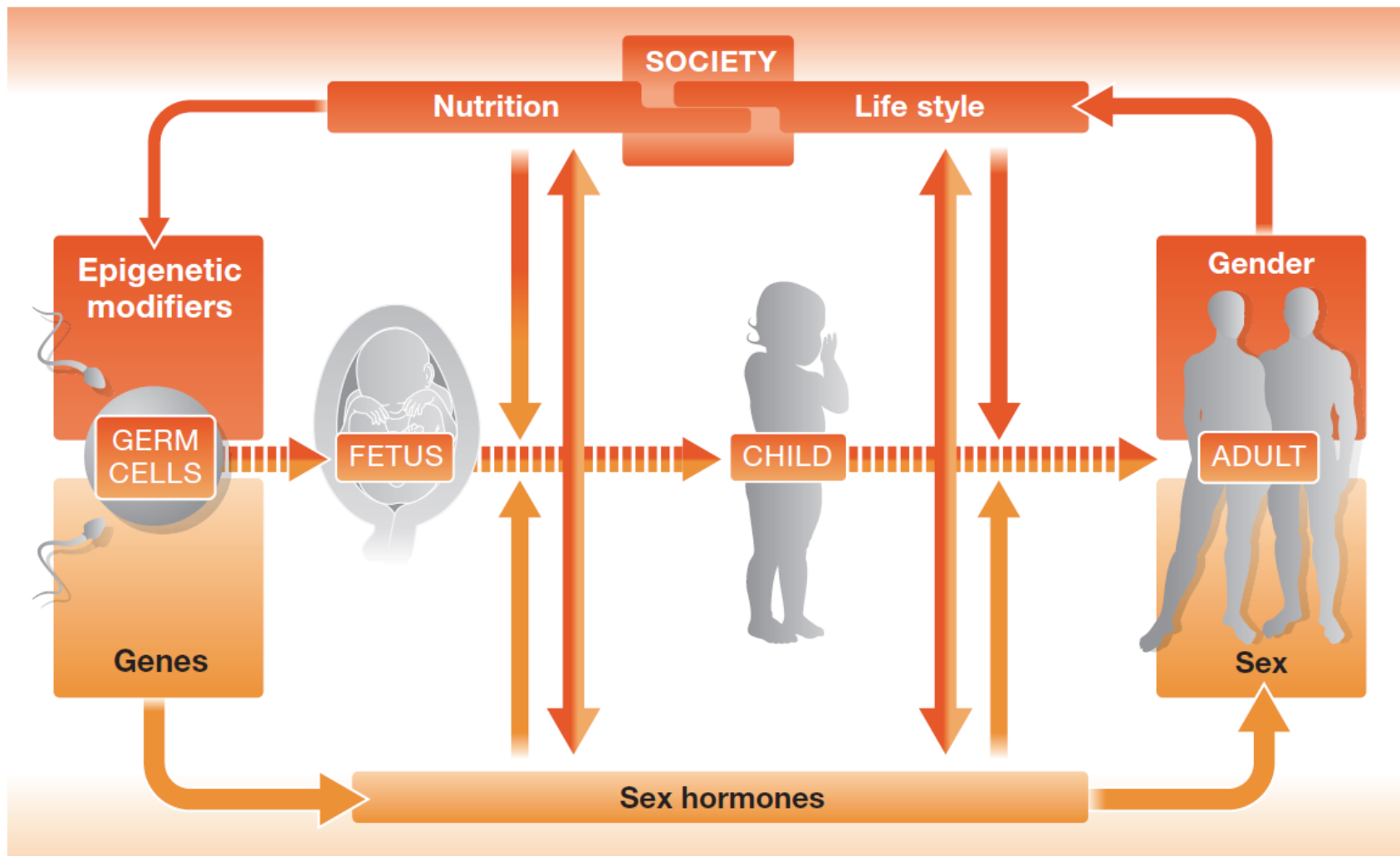
<b>Call - Better Health and care, economic growth and sustainable health systems .....</b>	<b>9</b>
<b>1.1 Personalised medicine .....</b>	<b>9</b>
SC1-BHC-01-2019: Understanding causative mechanisms in co- and multimorbidities combining mental and non-mental disorders .....	10
SC1-BHC-02-2019: Systems approaches for the discovery of combinatorial therapies for complex disorders .....	11
SC1-BHC-03-2018: Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease .....	12
SC1-BHC-04-2018: Rare Disease European Joint Programme Cofund .....	13
SC1-BHC-05-2018: International flagship collaboration with Canada for human data storage, integration and sharing to enable personalised medicine approaches .....	16
SC1-BHC-30-2019: Towards risk-based screening strategies for non-communicable diseases .....	18

# Topics of my presentation

- The interaction of **sex and gender** in biomedicine, its contribution to health and disease across different disease entities – as a first step towards personalized medicine
- How to measure the **sociocultural dimension gender** as risk factor and predictor in personalized medicine approaches
- **Drug development: Sex-related** differences in basic research and drug development
- **Sex- and gender-related differences** in frequent NCD, eg cardiovascular disease, in risk factors and comorbidities,



# Sex and gender contribute to disease development



# How to measure gender

## The generally accepted view (eg CIHR)

### Gender roles

Behavioral norms men/women in society, expectations  
context: institutions (e.g. family), labor force, educational system

### Gender identity

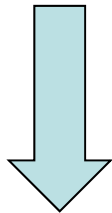
How we see ourselves as female/male (or as third gender)

### Gender relations

How we interact with or are treated by other people  
(based on our ascribed gender)

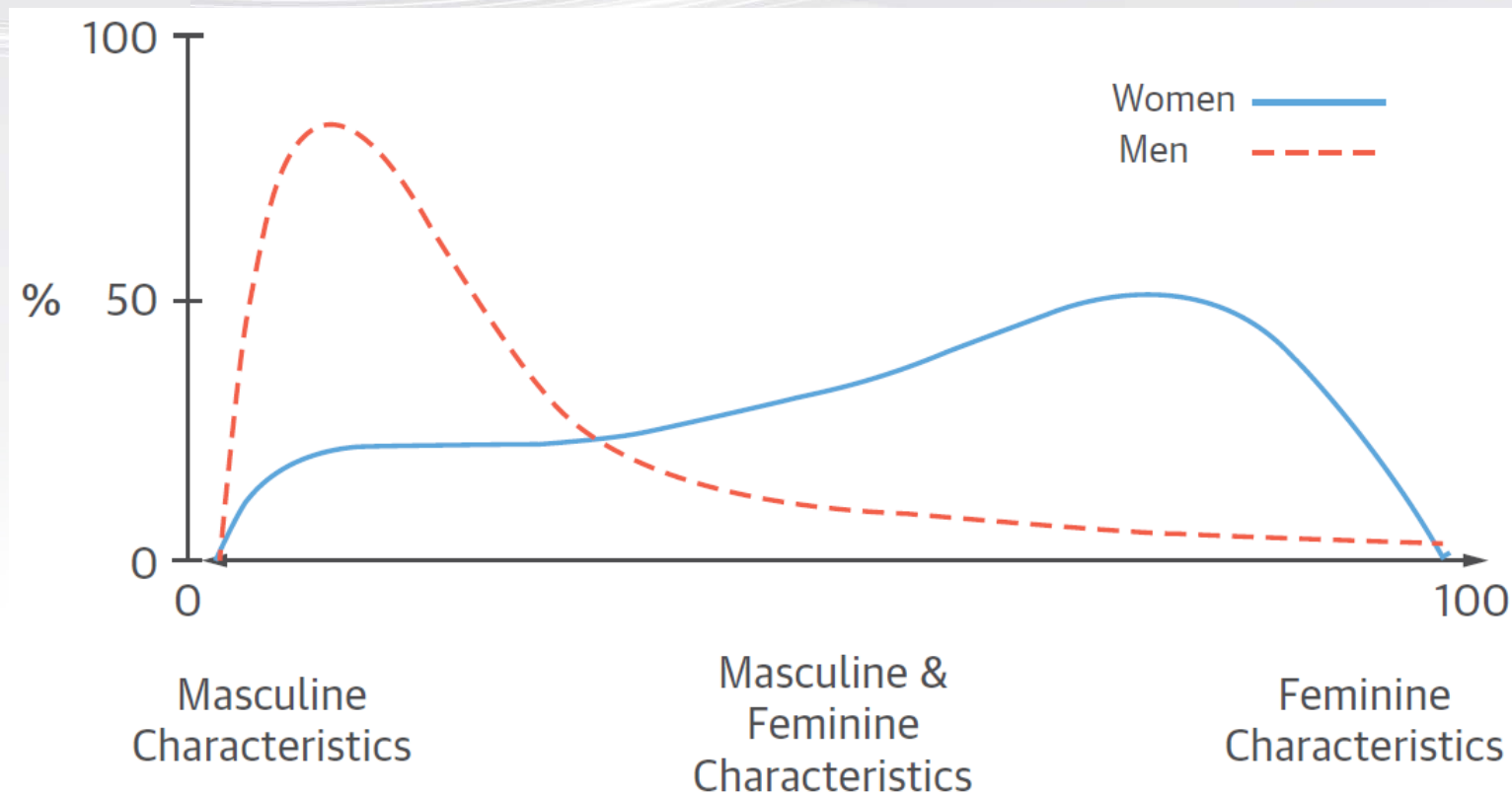
### Institutional gender

Reflects the distribution of power between men and women in the political, educational, and social institutions in society. The institutionalized aspect of gender also shapes social norms that define, reproduce, and often justify different expectations and opportunities for men and women.



Develop gender score

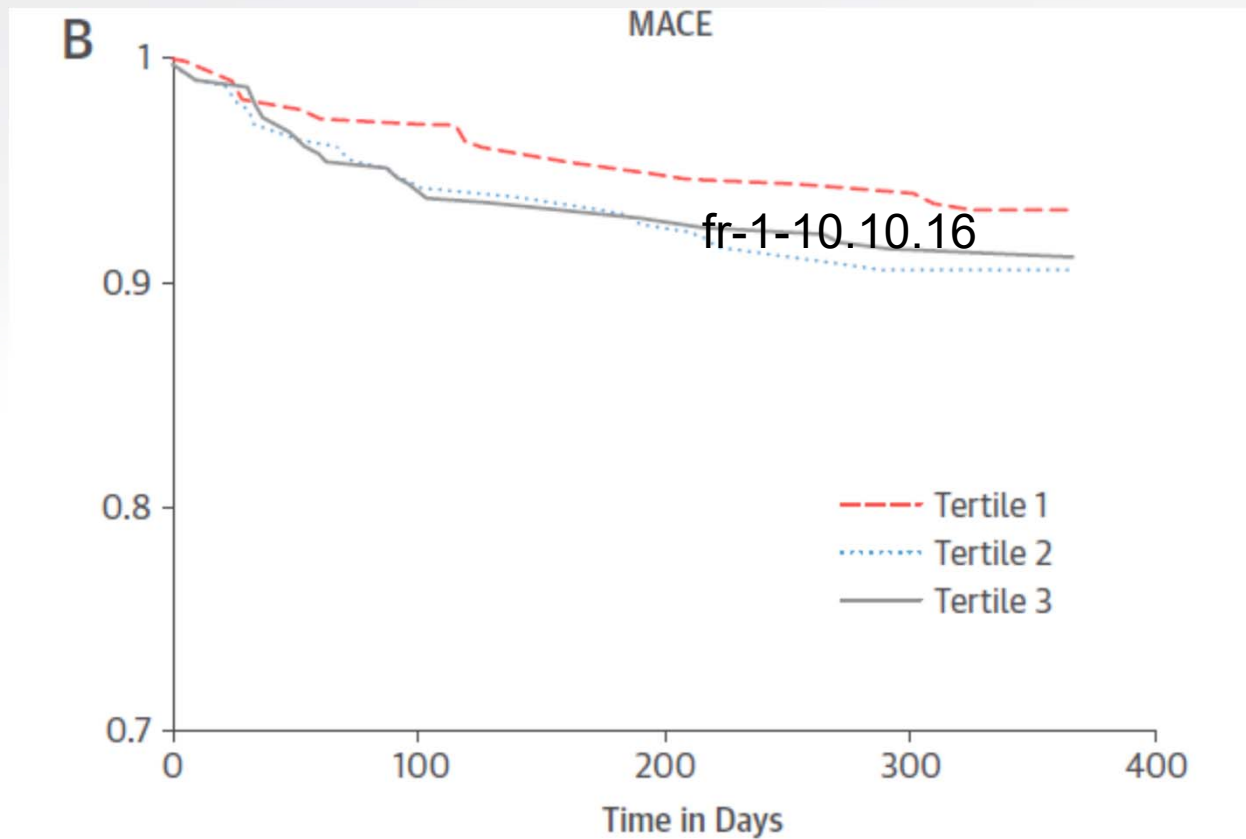
## Gender score distribution in men and women with premature acute coronary syndrome



1024 patients, Genesis Praxy

Pelletier et al., 2015, JACC 2016

# Gender is a strong predictor of major cardiovascular events after acute coronary syndromes



Some biological risk factors are more closely associated with gender than with sex

Pelletier et al., 2015,  
JACC 2016

# Gender predicts the outcome after acute coronary syndromes better than biological sex

In the genesis Praxy study, 1024 patients with ACS (50 % women) were followed for at least 12 months.

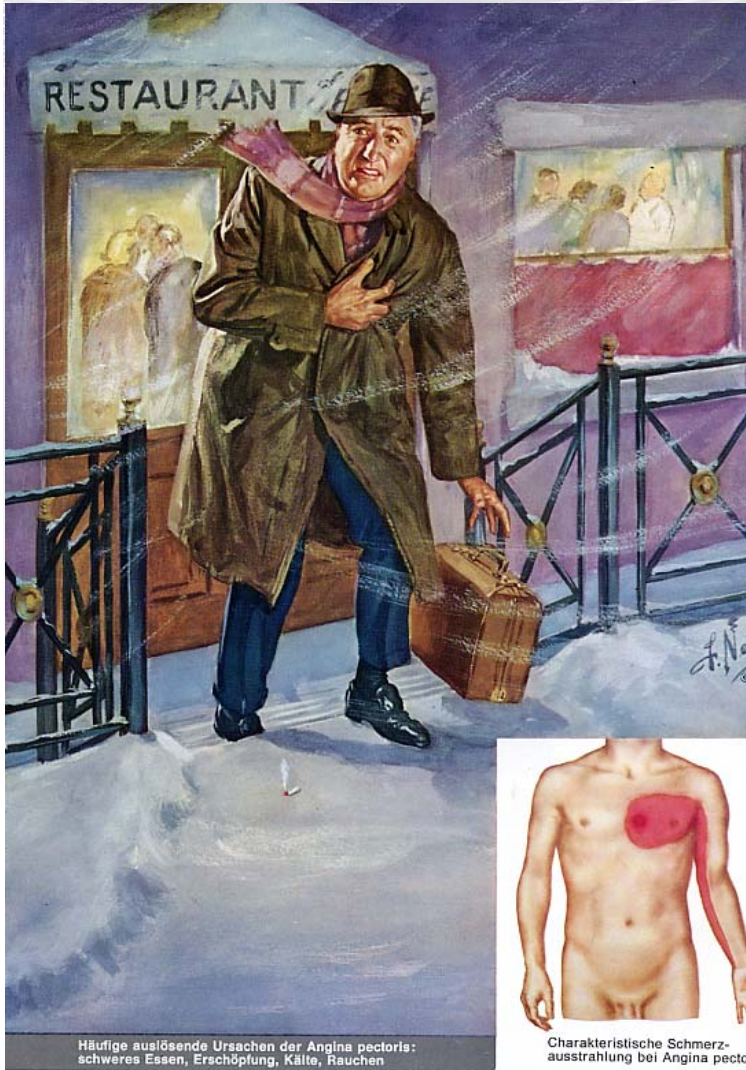
Female **gender score** was associated with re-events whereas **female biological sex** was protective.

**TABLE 2** Multivariable Cox Proportional Hazards Regressions: Association Between the Gender-Related Score and Recurrent ACS

	Recurrent ACS HR (95% CI)	p Value
Gender-related score (from score 0 to 100)	4.50 (1.05-19.27)	0.04
Female sex	0.50 (0.18-1.40)	0.18
Age	1.01 (0.94-1.10)	0.77
GRACE score, for each point increment	1.00 (0.97-1.02)	0.70
Previous CV event	2.13 (0.94-4.80)	0.07
Number of CV risk factors	1.02 (0.77-1.35)	0.92

ACS = acute coronary syndrome; CI = confidence interval; HR = hazard ratio; other abbreviations as in Table 1.

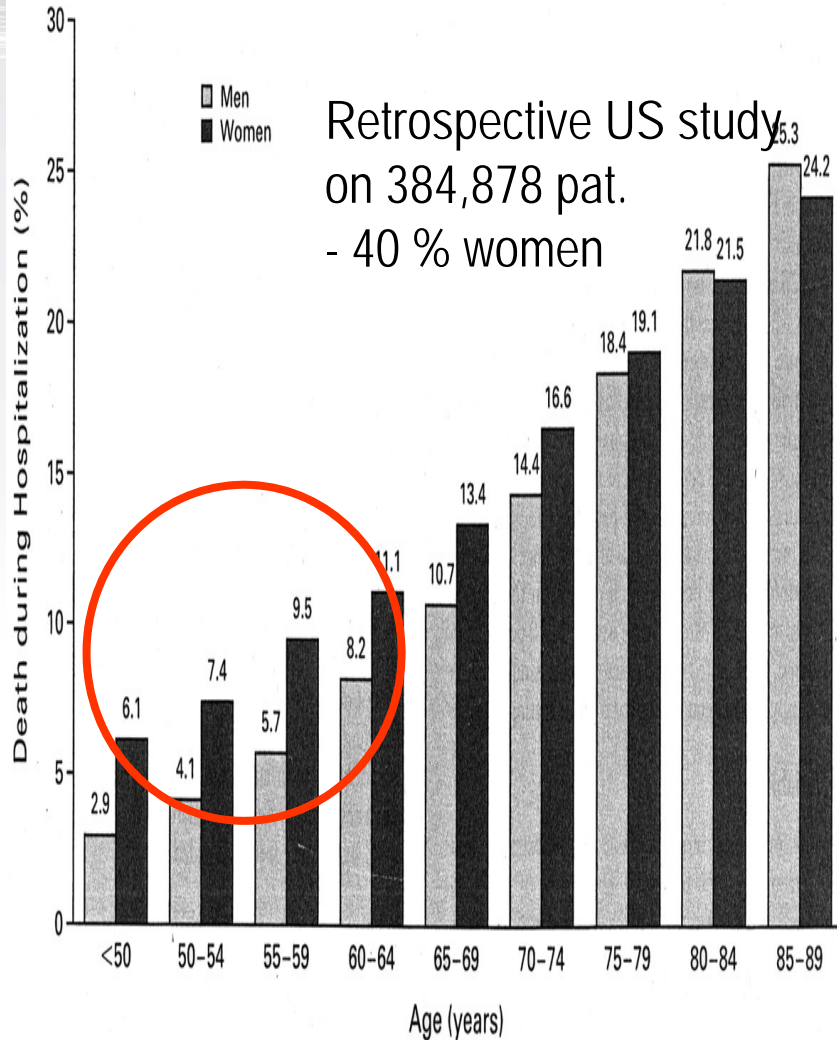
# Sex and Gender differences in presentation of myocardial infarction



ODD SYMPTOMS:  
For Kasten,  
diagnosis and  
treatment would  
prove difficult

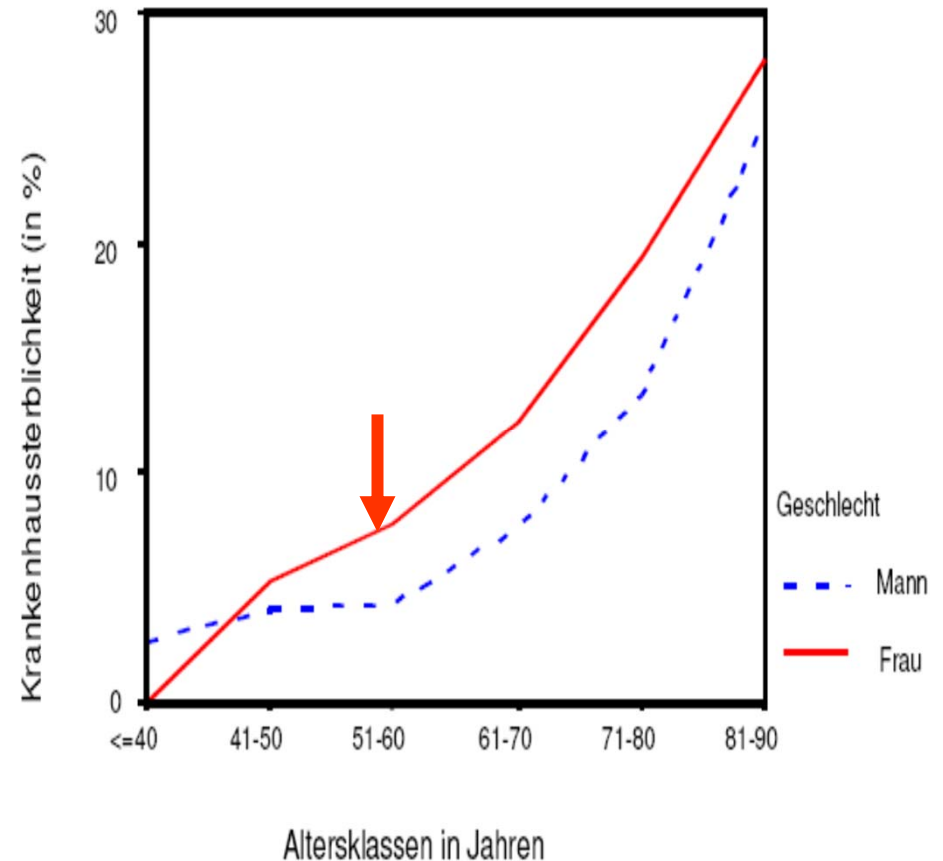
Heart disease is the **No. 1 killer of women**, yet American research shows that only one in four women realize it is a greater threat than cancer • A woman has a **50% chance of dying** from her first heart event, compared with a 30% chance for a man • Of those who survive their first heart attack, **38% of women will die within a year**, vs. 25% of men • **46% of women are disabled** by heart failure after a heart attack, compared with 22% of men

# Sex and Gender in cardiovascular disease - Higher early mortality in women with myocardial infarction



NEJM 1999

## Mortality after MI 2005 in Berlin, 5000 patients



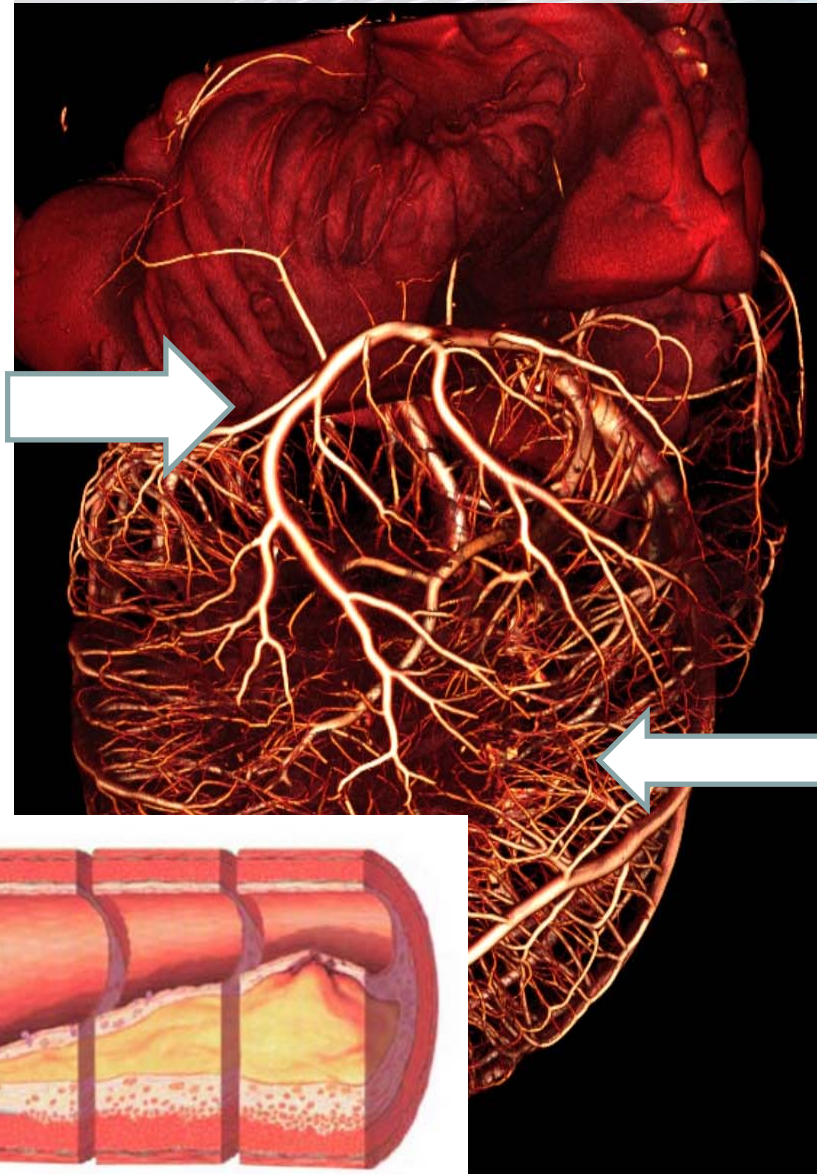
# Are there differences in cardiovascular disease mechanisms in women and men?

## Classical CAD:

### Large coronary artery disease

#### Men

- Atherosclerosis
- Plaques

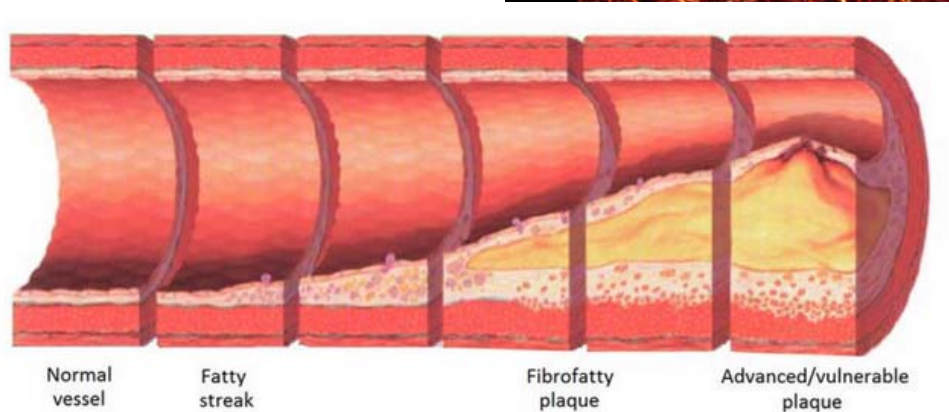


#### Women

- Spasms
- Dissections
- Dysfunction

#### Microvascular disease

- Heavily understudied, specific research needed



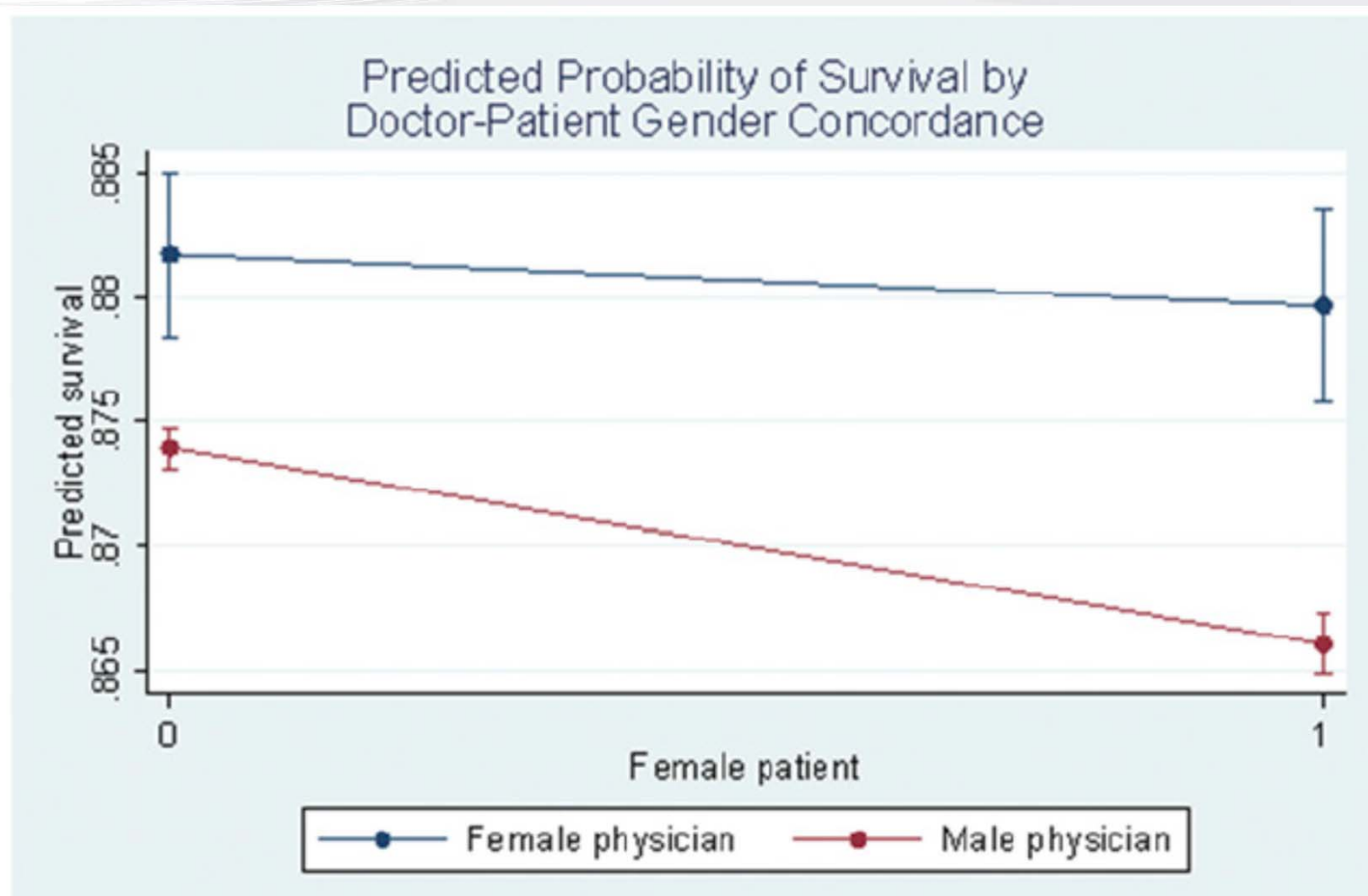


# Gender related problem: Women with myocardial infarction arrive later in hospital than men

Country	Condition	Intervall: medical contact – hospital admission	Hospital intervention	
France, all	STEMI	Men 200 / Women 245		Donataccio, 2015
Fr, Brittany	STEMI	M 209 / W 235		Leurent, 2014
Spain	STEMI	M 240 / W 307		deMiguel, 2013
NL	STEMI	<65 y: Men: 150 min / Women 165	Men=women	Otten, 2013
DE	Stemi	M154 / W 189		Ladwig , 2009
SW	STEMI	M169 / W 190		Von 51/ 80 auf 43 / 48 nach intervention Naegele 2011, rad 2012
US	STEMI	M150 / W 195		
Australia	STEMI	M161 / W 217		

# Patient–physician gender concordance and increased mortality among female heart attack patients

Brad N. Greenwood<sup>a,1</sup>, Seth Carnahan<sup>b</sup>, and Laura Huang<sup>c</sup>



**Fig. 1.** Gender concordance and patient survival: results from Table 2, column 3, 90% confidence interval displayed. Estimates include controls and hospital quarter fixed effects. Covariates held at sample means.  $n = 581.797$ .

# Sex and gender differences in the risk factors and comorbidities of NCD

[https://gender.charite.de/en/research/projects\\_with\\_the\\_eu/gencad/](https://gender.charite.de/en/research/projects_with_the_eu/gencad/)



## FACTSHEET for healthcare professionals

### GENCAD

#### Gender differences in coronary artery disease in Europe

- Socioeconomic factors
- Depression and stress
- Rheumatic diseases
- Preeclampsia
- Genetic factors, sudden death
- Erectile dysfunction
- Menopause, Andropause, Hypogonadism

#### Gender differences in classical risk factors

- Coronary heart disease develops 7-10 years later in women compared to men. Overall, more women are affected, since they live longer and the disease develops in old age.<sup>1</sup>
- Hypertension occurs more frequently in men before the age of 50, and in women after the age of 50. Hypertension leads to more strokes and heart failure in women than in men.<sup>2,3</sup>
- Diabetes increases the risk of cardiovascular disease more in women than in men.<sup>4,5</sup> Women with diabetes and associated risk factors are high risk patients, and need intense management and treatment.<sup>6</sup>
- Dyslipidemia is an equally strong risk factor in women and in men. Lipid lowering therapy should therefore be used in both.<sup>1</sup>
- Smoking is a relatively greater risk factor in younger women than in men and smoking rate in women has been reduced less than in men.<sup>7</sup>

- Age
- Hypertension
- Diabetes
- Smoking



#### Gender differences in non-classical risk factors

- Poor socioeconomic status contributes to gender disparities in cardiovascular health.<sup>8,9</sup>
- Depression and sustained mental stress occur more often in women than in men and are more important risk factors in women.<sup>10,11</sup>
- Autoimmune and rheumatic diseases occur more often in women and are frequently associated with cardiovascular disease.<sup>12</sup>
- Preeclampsia is an increasingly recognized risk factor in women.<sup>13</sup> Women who develop preeclampsia have a twofold elevated risk of developing cardiovascular disease later in life.<sup>14-17</sup>
- Genetic factors are important in premature heart disease in women and in men.<sup>18</sup>
- Erectile Dysfunction is associated with general metabolic and cardiovascular health risks in men.<sup>19</sup>
- Menopause, polycystic ovary syndrome, andropause and hypogonadism are associated with increased cardiovascular risk in women and men.<sup>2,13,19,20,21</sup>


- Socioeconomic status
- Mental stress
- Autoimmune & rheumatic diseases
- Preeclampsia
- Sex hormones



#### Gender-specific mechanisms of disease

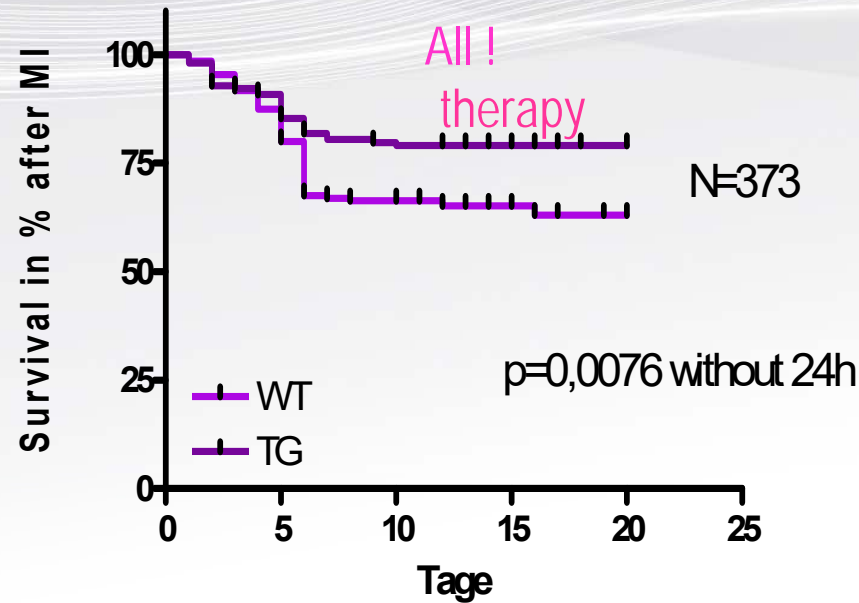
- In men, arteriosclerosis of large coronary arteries is the dominant mechanism leading to myocardial ischemia and infarction.<sup>22</sup>
- Middle-aged women frequently have angina pectoris and myocardial ischemia in the presence of normal coronary arteries. The term ischemic heart disease is suitable for this form of disease.<sup>23-25</sup>

- Large coronary artery arteriosclerosis
- Ischemic heart disease
- Non-obstructive functional coronary artery disease
- Stress-induced heart disease, spasms and dissection

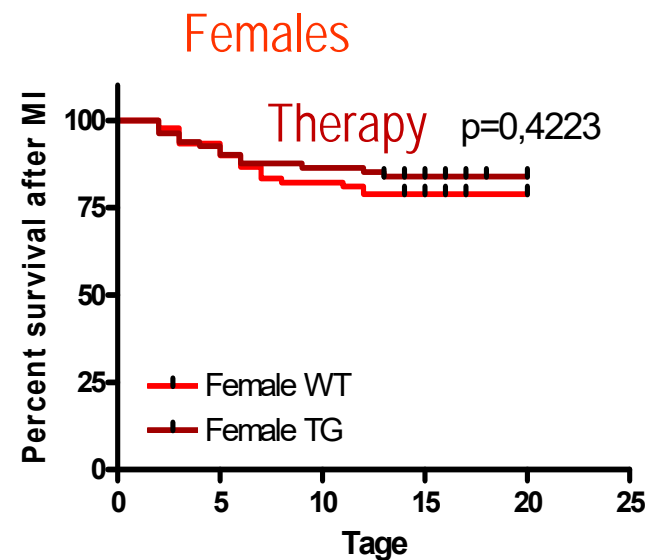
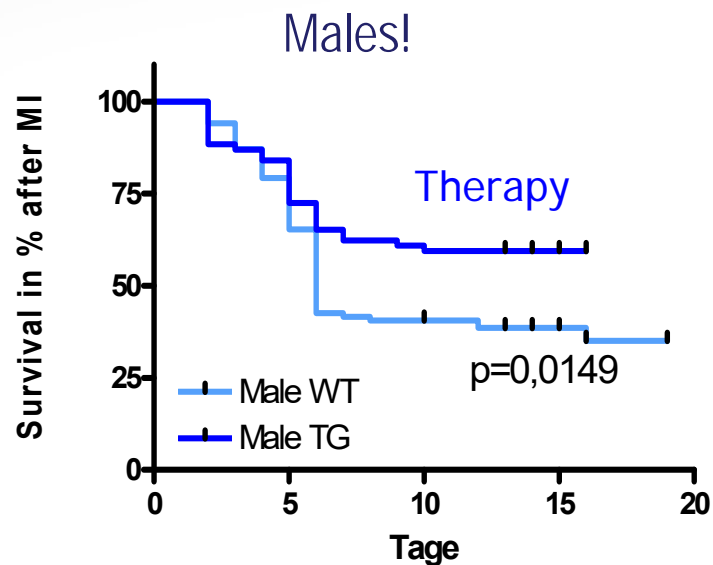


**Underestimation of the role of  
biological sex  
in basic research and drug development**

# Drug development should be done in male and female mice - example: survival after MI!

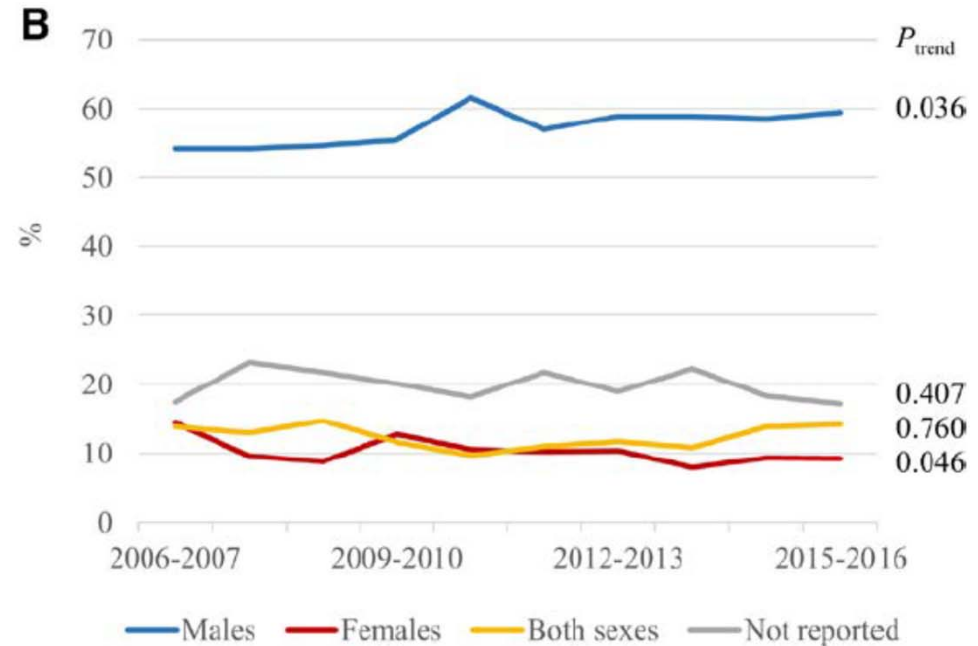
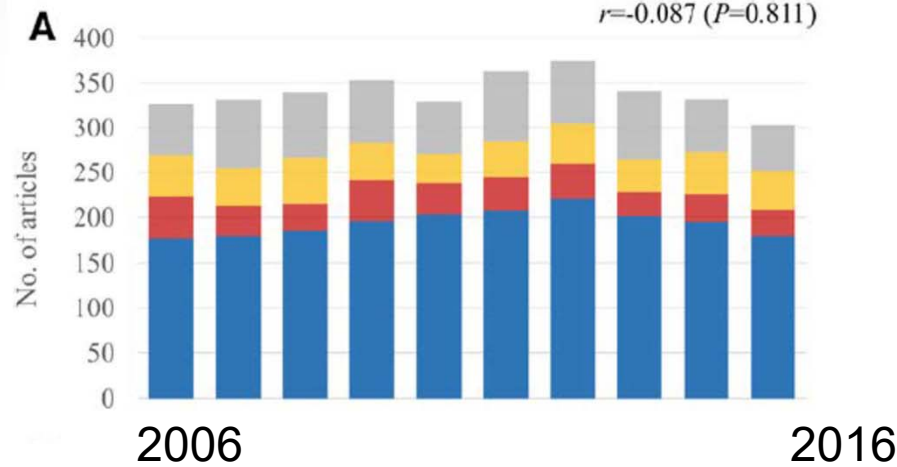


Improvement is seen in the whole cohort and in males, not in females.



# Sex Bias Is Increasingly Prevalent in Preclinical Cardiovascular Research: Implications for Translational Medicine and Health Equity for Women

## A Systematic Assessment of Leading Cardiovascular Journals Over a 10-Year Period



**Figure.** Temporal patterns in the sex of animals used in preclinical cardiovascular research over a 10-year period.

# Sex and gender differences occur across human diseases

**Table 1** | Publications with sex and gender differences in the most frequent clinical entities

Cardiology	Rheumatology/ Immunology	Pneumology	Nephrology	Gastro- enterology/ Hepatology	Neurology	Endo- crinology	Oncology	Haematology
Hypertension (414)	Lupus erythematosus (68)	Asthma (140)	Renal failure (27)	Hepatitis B (22)	Multiple sclerosis (65)	Diabetes mellitus (447)	Skin carcinoma (45)	Anaemia (44)
Myocardial infarction (275)	Rheumatoid arthritis (41)	Lung cancer (116)	Diabetic nephropathy (11)	Hepatitis C (26)	Stroke (129)	Obesity (349)	Gastric cancer (25)	Leukaemia (49)
Heart failure (153)	Systemic sclerosis (3)	Chronic obstructive pulmonary disease (36)	Glomerulonephritis (9)	Hepato-cellular carcinoma (37)	Alzheimer's disease (104)	Osteoporosis (123)	Renal cell carcinoma (17)	Lymphoma (34)
Atrial fibrillation (38)	Fibromyalgia (15)	Pulmonary hypertension (12)	Polycystic kidney disease (12)	Inflammatory bowel disease (13)	Epilepsy (56)	Hypothyroidism (33)	Bladder cancer (22)	Thrombocytopenia (6)
Coronary heart disease (207)	Sjögren's syndrome	Pulmonary embolism (110)	Renal artery stenosis (0)	Colorectal cancer (24)	Parkinson's disease (69)	Hyperthyroidism (16)	Thyroid carcinoma (16)	Purpura (2)
Cardiomyopathy (41)	Ankylosing spondylitis (11)	Sarcoidosis (6)	IgA Nephropathy (2)	Autoimmune Hepatitis (2)	Muscular dystrophy (11)	Morbus Addison/Cushing disease (5)	Pancreatic carcinoma (10)	Agranulocytosis (0)

# Summary and conclusions

- The inclusion of **sex and gender** in biomedicine is a first step towards personalized medicine
- **The sociocultural dimension gender** is a measurable risk factor and predictor of adverse events and should be included in clinical trials
- **Sex-related** analysis provide significant insights and improvement in basic research and drug development
- **Sex- and gender-related differences play a role in NCD,** in risk factors and comorbidities,





Thank you for attending this  
webinar

For background information, some  
resources, reading list → see the 'hand-  
out' that you will receive.