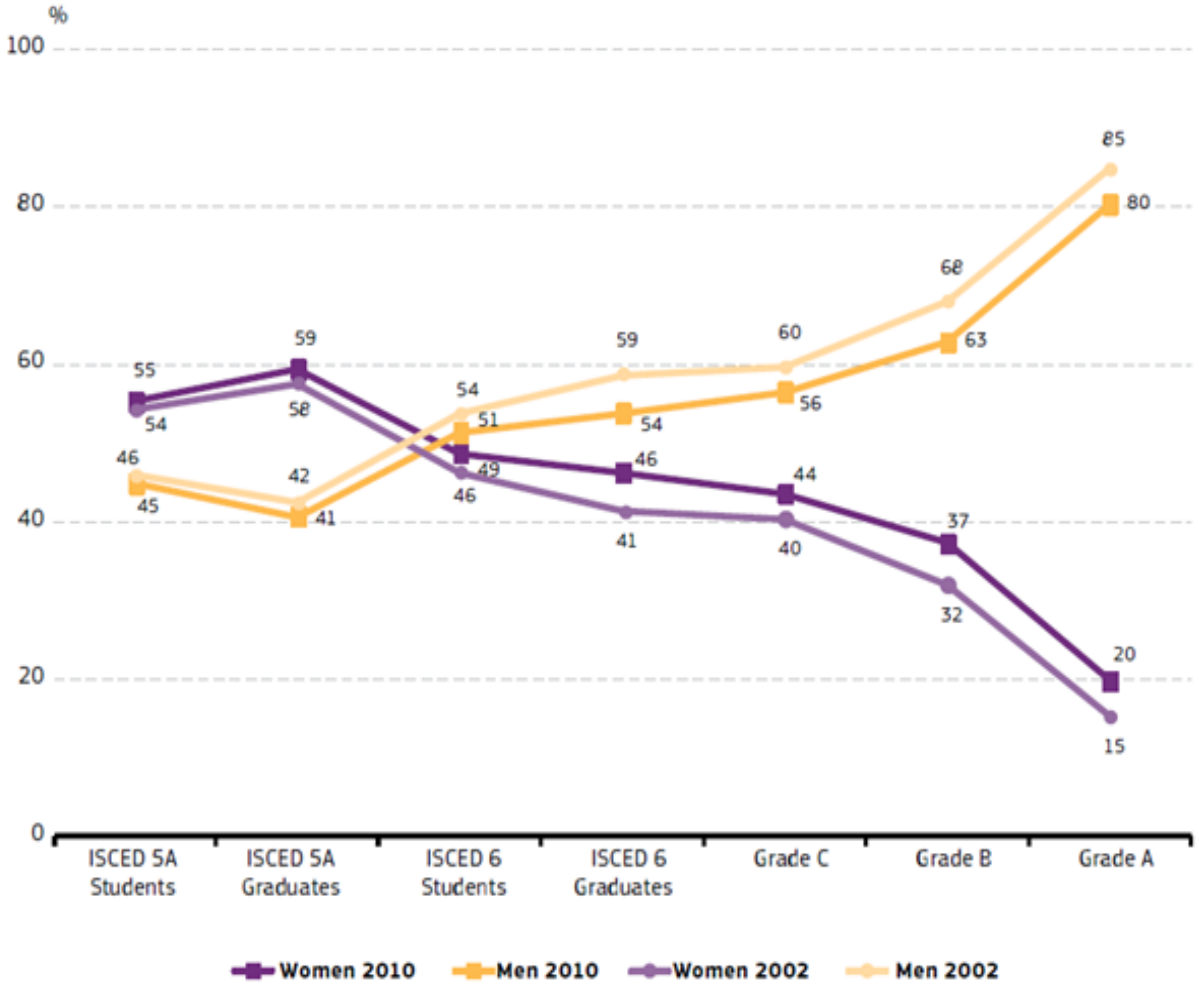
Gender in European Research and Innovation Policy: ERA, Horizon 2020, Structural Change Report, Gendered Innovations Report

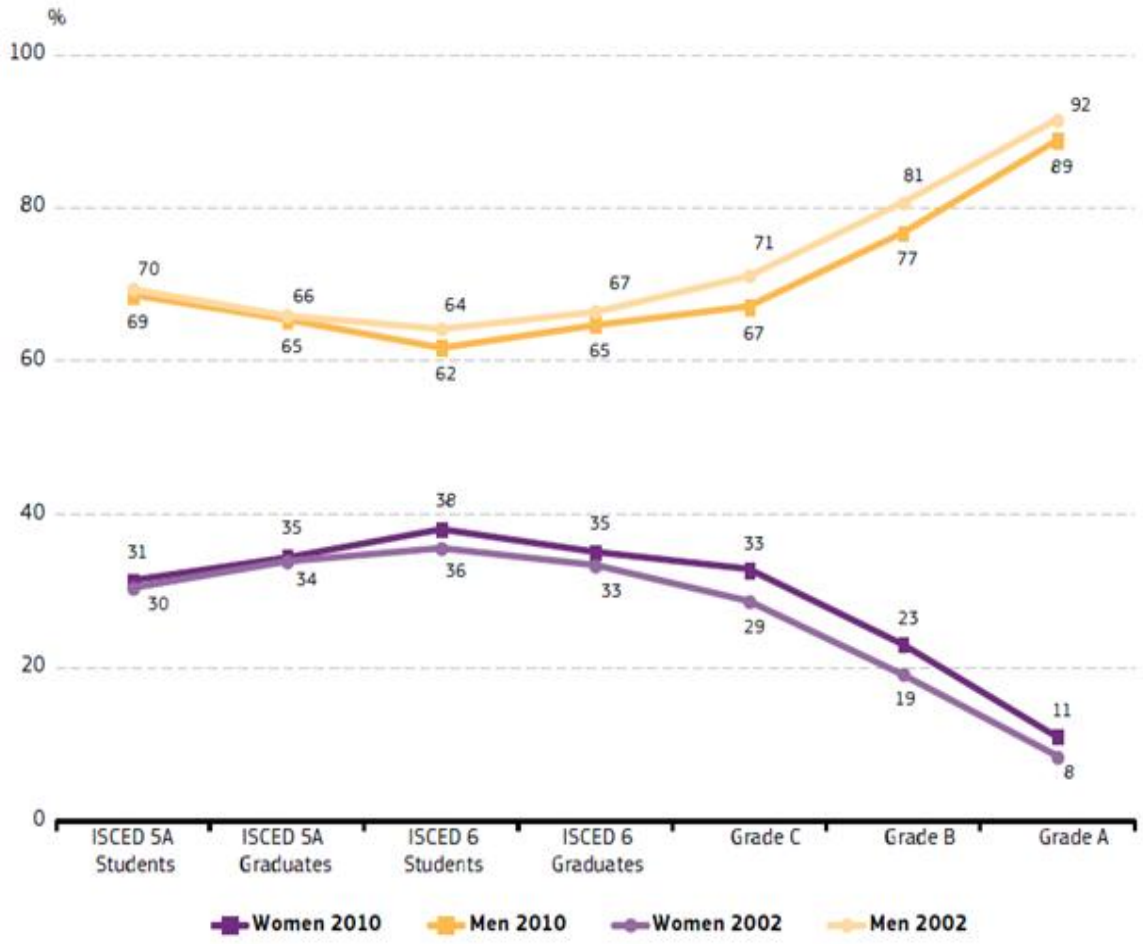
Prof. Inés Sánchez de Madariaga
Chair, genderSTE
Professor of City Planning
Rector's Delegate for Gender Equality
Technical University of Madrid

Gender Statistics in Research and Innovation
EU, Spain, UPM

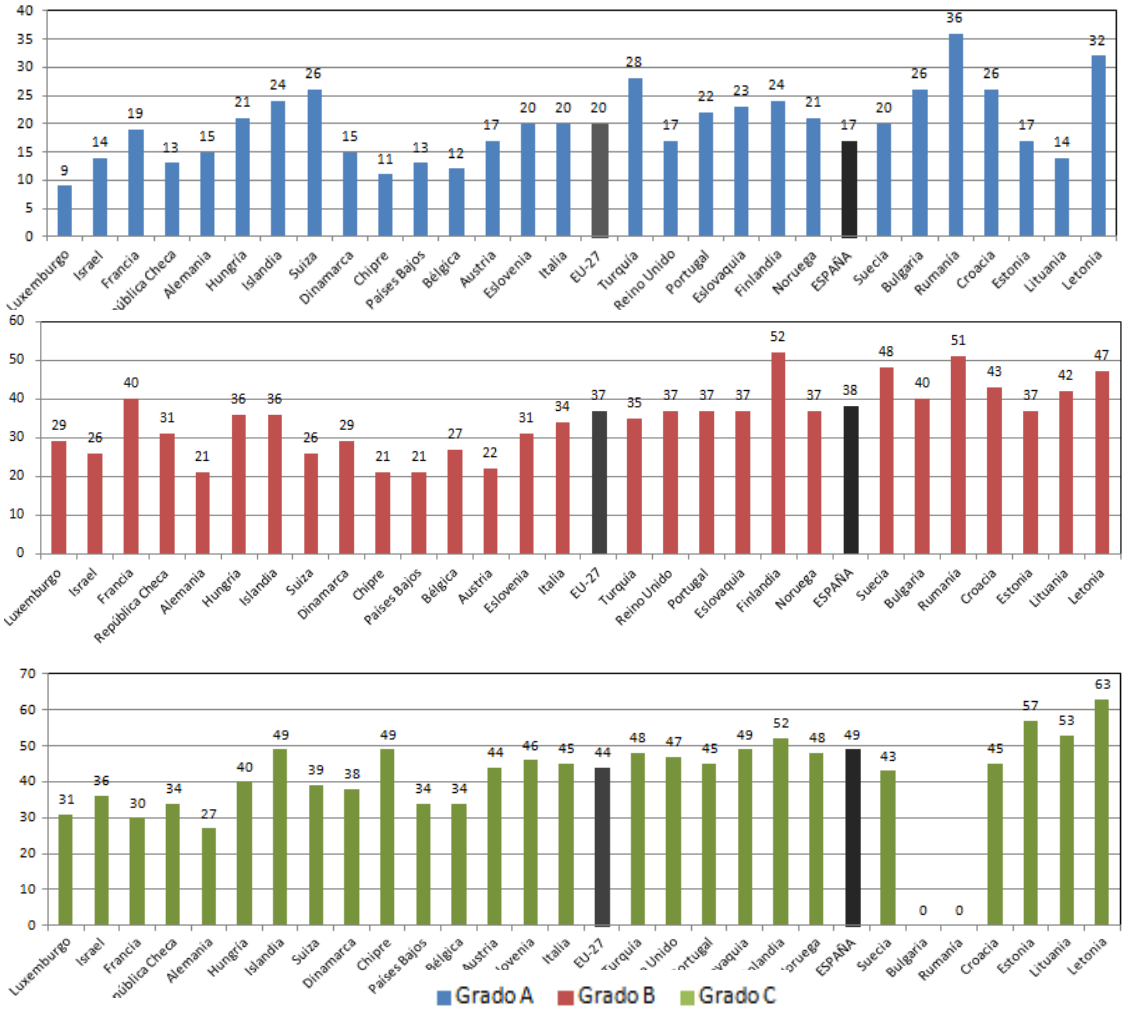
The “leaky pipeline” in Europe 2002-2010. All fields



The “leaky pipeline” in Europe 2002-2010. Engineering fields

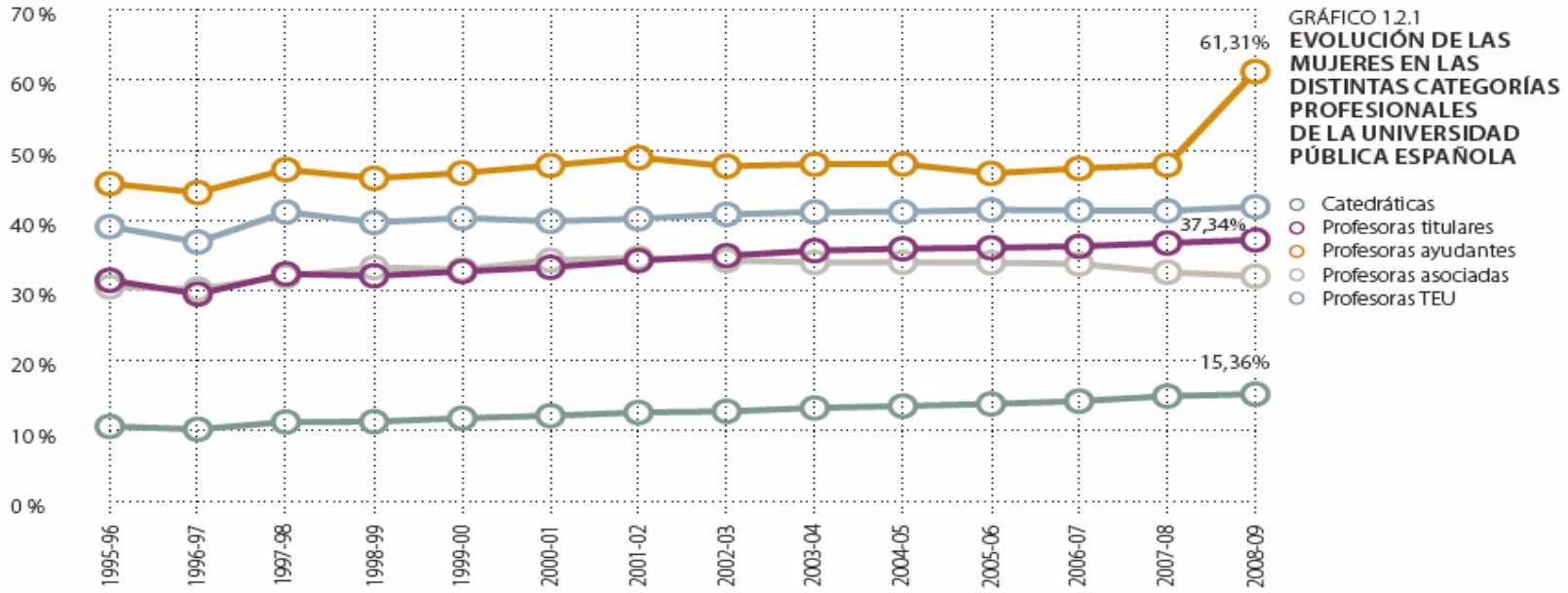


Proportion fo women by country and category, EU. 2010.
Source: She Figures 2012

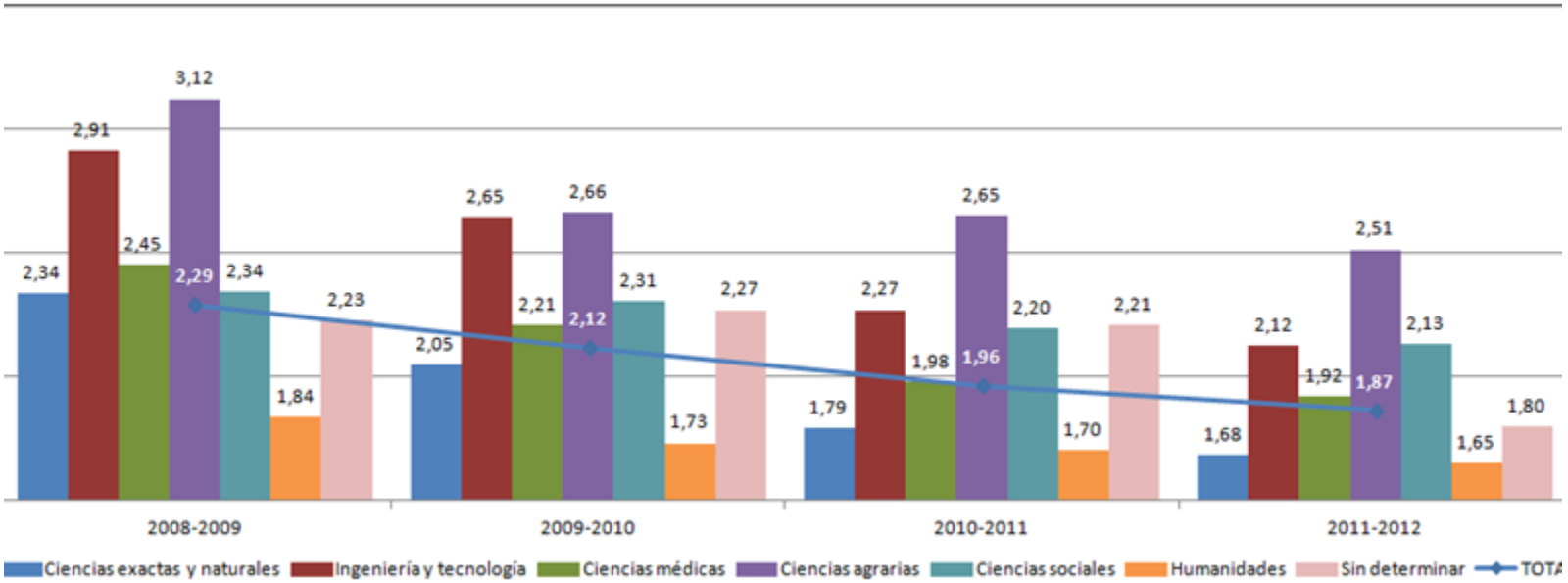


Fuente: SHE Figures 2012.

Time alone does not improve figures significantly.
Evolution of the participation of women in research, Spain, by grade 1995-2009

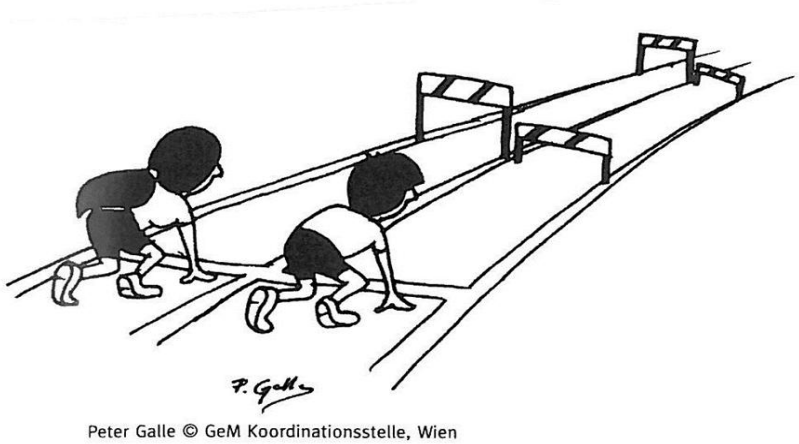


2008-2012
Glass Ceiling Index by field of knowledge, Spain



El Índice de techo de cristal capta las dificultades que las mujeres encuentran en su ascenso en la carrera investigadora, midiendo las oportunidades relativas de las mujeres, en comparación con las de los hombres, de alcanzar la posición más alta en la jerarquía investigadora. El Índice de techo de cristal compara la proporción de mujeres en la posición más alta (Cátedras) en relación a la de las mujeres en la investigación (Cátedras, Titularidad y demás categorías profesionales), indicando la posibilidad de que las mujeres puedan ascender en su profesión investigadora. El índice va de 0 a infinito. Un Índice de techo de cristal con valor 1 significa que no existen diferencias en la promoción entre mujeres y hombres. Un valor por debajo de 1 indicaría que las mujeres están sobrerrepresentadas en las Cátedras y un Índice de techo de cristal cuyo valor está por encima de 1 marca la existencia del techo de cristal, es decir, que las mujeres están infrarrepresentadas en las Cátedras. Cuanto mayor sea el valor del Índice, mayor es el techo de cristal y más difícil resulta para las mujeres alcanzar la posición más alta en la carrera investigadora.

Greater barriers and lesser personal and professional support



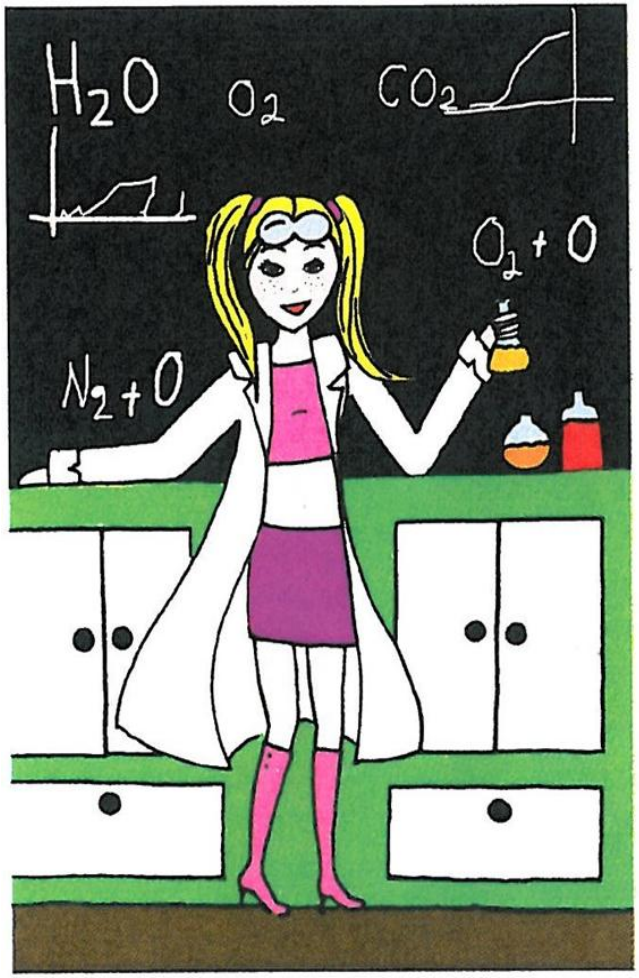
Peter Galle © GeM Koordinationsstelle, Wien

- – Women assume or are given a greater teaching and a greater organisational workload
- – Women assume a greater workload in the home
- – Women have less access to networks and are less often mentored
- – Women's scientific work is quoted less often by peers
- – Women are less often invited or proposed as speakers, to receive awards, to be part of committees and expert groups
- – When women speak, they are interrupted more often.
- ….

Courtesy of AMONET

Gender stereotypes in research

Who's the Scientist?
Seventh graders describe scientists before and after a visit to Fermilab:
http://ed.fnal.gov/projects/scientists/amy.html



Gender bias in evaluation of quality and merit. We are all biased.

PNAS

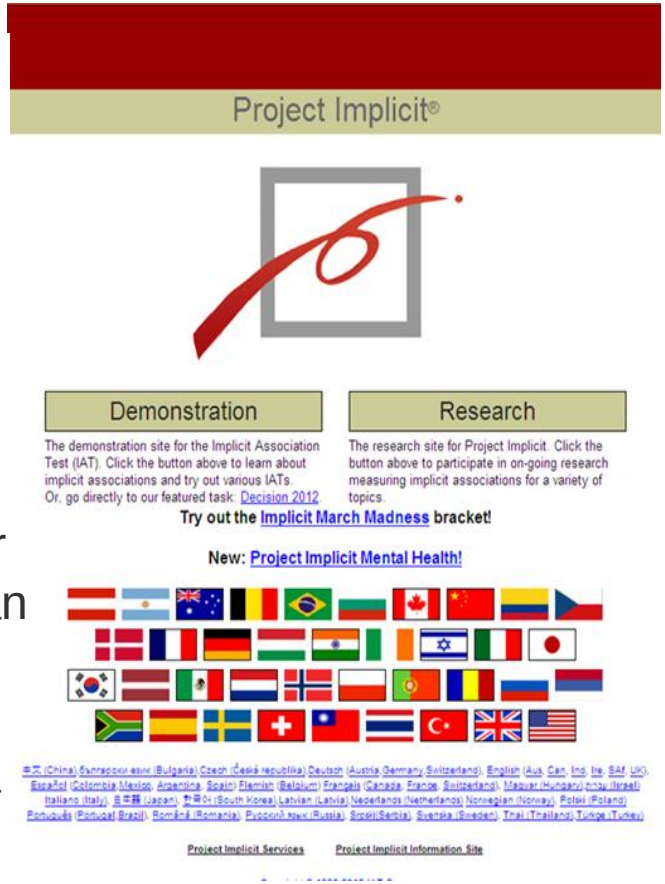
Science faculty's subtle gender biases favor male students

Corinne A. Moss-Racusin[a,b], John F. Dovidio[b], Victoria L. Brescoll[c], Mark J. Graham[a,d], and Jo Handelsman[a,1]

[a]Department of Molecular, Cellular and Developmental Biology, [b]Department of Psychology, [c]School of Management, and [d]Department of Psychiatry, Yale University, New Haven, CT 06520

Edited* by Shirley Tilghman, Princeton University, Princeton, NJ, and approved August 21, 2012 (received for review July 2, 2012)

Despite efforts to recruit and retain more women, a stark gender disparity persists within academic science. Abundant research has gender disparity in science (9–11), and that it "is not caused by discrimination in these domains" (10). This assertion has re-



- The same CV evaluated by professors of top US universities received consistently a significant better grade when they appeared to be signed by men than when they were attributed to women.

- If you want to measure your own bias, you can do a 10 minute test at the web of the Implicit Project, Harvard University

Gender bias in evaluation is higher in promotion to the higher higher ranks and among men evaluators

The Spanish White Paper on the Situation of Women in Science of 2011 found out that:

“Comparing women and men of similar age, academic age, field of knowledge, and scientific productivity, measured in publications and thesis directed, men had 2,5 more probabilities to be promoted to full professorship”

And

“for every male evaluator at a committe of 7 members, a woman candidate to a Grade A position had 14% less probabilities of being promoted than a male candidate, everything else equal””

Gender bias in evaluation of merit

- Spanish study on promotions to the highest rank of the academic ladder, full professorships (cátedras) for the period 2002-06. During this period a national system was in place (habilitación nacional) which provides a unique random natural experiment, with 35.000 candidates, 7.000 evaluators in committees of seven, all fields of knowledge.

- The result of this study is that for every male member of a committee of seven, a woman candidate has 14% less possibilities to be promoted than a male candidate.

- In other words, with an all male committee, the probability for a woman candidate to become full professor comes close to zero.

Zinovyeva N. y M. Bagues (2010), "Does Gender Matter for Academic Promotion? Evidence from a Randomized Natural Experiment", FEDEA WP2010-15.

Gender bias in evaluation of merit

- American great philarmonic orchestras, where there were practically no women musicians before the 1970s –"women do not have talent for music", the argument went- started hiring women when auditions became blind and evaluators could not see the person who was playing the instrument.

- The number of women hired increased even more significantly when the floors were covered with carpets and women candidates could not be identified through the sound of their high heels.

Claudia Golding, Professor of Economy at Harvard University: article "Orchestrating impartiality"

Gender bias in evaluation of merit

Women had to have 2.4 more merits than men to achieve the same evaluation, equivalent to 20 articles in peer review journals, in calls for researcher positions at the Swedish Academy of Medicine.

Wenneras and Wold “Nepotism and sexism in peer-review”, Nature 1997.

Communication from the EC to the EU Parliament on the ERA, July 2012

Gender is one of the 5 key priorities:

- More effective national research systems
- Optimal transnational co-operation and competition
- An open labour market for researchers
- Gender equality and gender mainstreaming in research
- Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

ERA, Member States are invited to:

- Create a legal and policy environment and provide incentives to:
  - remove legal and other barriers to the recruitment, retention and career progression of female researchers while fully complying with EU law on Gender equality
  - address gender imbalances in decision making processes
  - strengthen the gender dimension in research programmes

ERA, Member States are invited to (cont.)

- Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender – charters, performance agreements, awards

- Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating research programmes

ERA, Research stakeholder organisations are invited to:

- Implement institutional change relating to HR management, funding, decision making and research programmes through Gender equality Plans which aim to:
  - Conduct impact assessment / audits of procedures and practices to identify gender bias
  - Implement innovative strategies to correct any bias
  - Set targets and monitor progress via indicators

ERA, The Commission will:

- Foster gender equality and the integration of a gender dimension in Horizon 2020 programmes and projects from inception, through implementation to evaluation, including through the use of incentives

- Adopt a Recommendation to Member States with common guidelines on institutional change to promote gender equality in universities and research institutions.

Gender in Horizon 2020

1. **Fostering gender balance in Horizon 2020 research teams**, in order to address the gaps in the participation of women in the Framework Programme's projects

2. **Ensuring gender balance in decision-making**, in order to reach the Commission's target of 40% of the under represented sex in panels and groups (50% for advisory Groups)

3. **Integrating gender/sex analysis in research and innovation (R&I) content,** helps improve the scientific quality and societal relevance of the produced knowledge, technology and/or innovation.

Gender in Horizon 2020

LEGAL BASIS

1. **The Horizon 2020 Regulation**

2. **The Rules for participation**

3. **The Specific Programme implementing Horizon 2020**

Gender in Horizon 2020

IMPLEMENTATION

1. Gender balance in decision-making :

ADVISORY GROUPS:

- **50% women/men**
- **at least one expert with gender expertise in research and innovation.**

EVALUATION PANELS:

- **Composition of panels: 40% target of the under-represented sex, taking into account the situation in the specific field**

Gender in Horizon 2020

C. IMPLEMENTATION

2. Gender balance in research teams

Article 33 of the Grant Agreement (GA):

- **33.1 Obligation to aim for gender equality:**

- *The beneficiary must take all measures to promote equal opportunities between men and women in the implementation of the action. It must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level*

- **In the EVALUATION PROCESS:**

  - *Gender balance comes into play as a* ***ranking factor to prioritize*** *ex aequo proposals*

Gender in Horizon 2020

C. IMPLEMENTATION

3. Integrating gender/sex analysis in research and innovation (R&I) content

- **Gender analysis is considered a factor of EXCELLENCE (First Chapter, Article 16)**
- **The gender dimension is explicitly integrated into several topics across all the sections of the Work Program and these topics are flagged**
- **In the Proposal Template applicants are asked the following question: "Where relevant, describe how sex and/or gender analysis is taken into account in the project's content".**
  - **THIS WILL COUNT AS AN EVALUATION FACTOR, like any other item referred to the scientific content that is relevant to the content of research.**
  - **It will be integrated in the GRANT AGREEMENT and project reports, as in other parts of the project**

Gender in Horizon 2020

D. OTHER RELEVANT ISSUES

- * **H2020 incorporates at least one gender expert in each of the advisory groups working on the preparation of work programs.**

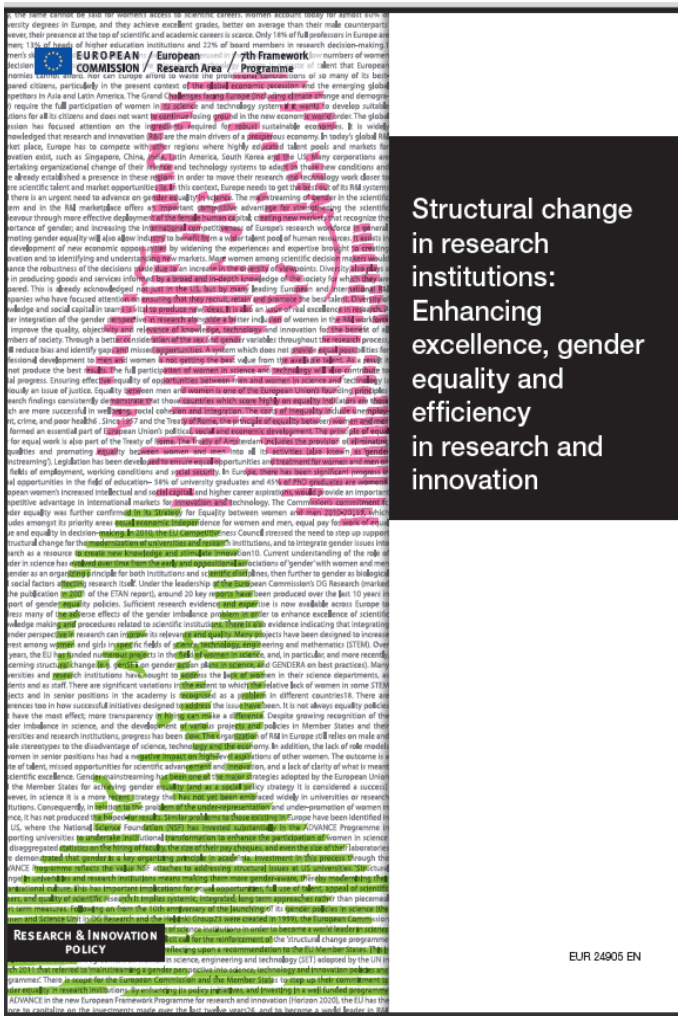
- **Training on gender Is included as one of the eligible project costs**

- **Part 16 of the Work Program, *Science with and for Society*, foresees a specific call on gender equality including continuous funding since 2010 for "Structural change in research institutions"**

A roadmap for action: EC Expert Report Structural Change of institutions, 2011

Recommendations

- Improving transparency in decision making
- Supressing (un)conscious bias in research institutions
- Promoting excellence through gender diversity
- Improving the quality and validity of research by integrating a gender perspective
- Modernising human resources management and work environments



Contents

1. Problems faced by research institutions
2. Essential elements of structural change
3. Solutions: Bringing about structural change
4. Gender Equality Strategy: Key steps for actors at the EU, national and institutional level
5. International Examples of Best Practice

Problems identified

1. Opaqueness in decision-making processes
2. Institutional practices inhibiting career opportunities
3. Employment policies and practices - barriers
4. Unconscious bias in assessing excellence
5. Wasted opportunities and cognitive errors in knowledge, technology and innovation

Prerrequisites for Structural Change (SCh)

1. Knowing the institution
2. Securing top-level support
3. Generating effective management practices

Recommendations for SCh

1. Making decision-making transparent
2. Removing unconscious bias from institutional practices
3. Promoting excellence through diversity
4. Improving research by integrating a gender perspective
5. Modernising human resources management and the working environment

SCh Recommendations address:

1. Member States
2. Universities and Scientific Institutions
3. European Commission
4. Gatekeepers of Scientific Excellence
5. European-wide Organisations

- Selection of best international practices
  - addressing member states, institutions and other stakeholders

- STRIDE (Science and Technology Recruiting to Improve Diversity and Excellence Committee) – University of Michigan, US.
- University of Tromsø (Norway).
- CERN Tripartite Employment Conditions Forum, 2010.
- Harvard University Staff Training Programs, US.
- Spanish Law of Science and Technology.
- US National Science Foundation ADVANCE Program .
- (…)

STRIDE (Science and Technology Recruiting to Improve Diversity and Excellence Committee) – *University of Michigan*

- There were a number of factors that inhibited the University's success at recruiting, largely a result of inattention and of ignorance about the effect of unconscious bias on the outcome of the process.
- Through a process of introducing senior faculty, both men and women, to the academic theory and data on evaluation bias and on aspects of academic climate that may feel unwelcoming or hostile, the University was able to engage a group of senior faculty in creating an approach to recruitment that resulted in wider pools of excellent candidates.
- Department chairs were able to request surveys of climate in their departments, and to get assistance addressing climate problems within the department.
- The university reports significant progress regarding recruitment of women in science and engineering fields, from 13% of all new hires to 28% (pre- and post-ADVANCE).
- The engagement and leadership of opinion leaders among the faculty, including senior and highly respected men, was reported as a critical element in the success of STRIDE.

University of Tromsø (Norway)

- Board of Directors adopted the genSET recommendations in full as the guiding principles for their gender equality work in all faculties
- Focus on increasing the number of women professors (from current 23% to 30% by 2014)
- http://www2.uit.no/ikbViewer/page/nyheter/artikkel?p_document_id=207829

CERN Tripartite Employment Conditions Forum, 2010

- Reaffirm the principles of non-discrimination and equality of treatment
- Strengthen diversity policy through management commitment, specific training, examination and adaption of all procedures, practices and composition of boards at all levels, and carry out awareness-raising
- Investigate factors responsible for the low number of women in top management, including the 'glass ceiling' effect and the 'leaky pipeline'
- Establish a career mentoring programme
- "...Factors responsible for a low number of women in top management, the "glass ceiling" effect and the 'leaky pipe', should be investigated. Active support should be provided for example to establish a career mentoring programme and to participate in a European women's network. Participation in studies at the European level to strengthen the career chances for women scientists should be envisaged..."

ADVANCE Programme (Increasing the Participation and Advancement of Women in Academic Science and Engineering careers)

- National Science Foundation, USA
- 10 million USD per year for new projects, 2001 – present
- Goal to develop systemic approaches to increase the representation and advancement of women in academic science, technology, engineering and mathematics (STEM) careers, thereby contributing to the development of a more diverse science and engineering workforce
- Extensive resource base for structural change

http://www.portal.advance.vt.edu

ERC (European Research Council)

ERC Scientific Council adopted a Gender Equality Plan 2007-2013, with the following included amongst the objectives:

- Raise awareness about ERC gender policy among potential applicants and improve gender balance among researchers submitting ERC proposals in all research fields
- Identify and challenge any potential gender bias in ERC evaluation procedure
- Achieve gender balance among ERC peer reviewers, and other decision making bodies (minimum 40% participation of the underrepresented sex

Research Council Norway

- Essential that gender perspectives are given adequate consideration in research projects where this is relevant
- Good research must take into account biological and social differences between women and men, and the gender dimension should be one of the main pillars of the development of new knowledge
- In research projects this dimension may be manifested through the research questions addressed, the theoretical approaches chosen, the methodology applied, and in the efforts to assess whether the research results will have different implications for women and men

Stanford University training on harassment

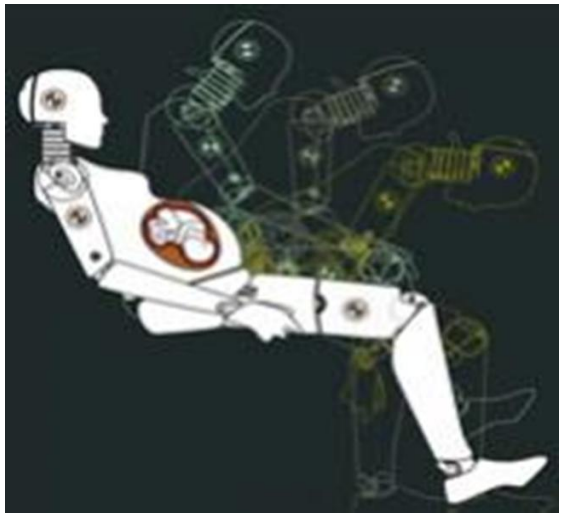
- Compulsory online training course on harassment that all employees have to take every year
- The two-hour training is very effective, reaches everyone, ensures high quality and consistency, allows for flexibility
- Also because all employees are required to take the course every year, the institution is better protected in case of legal challenges

Other examples:

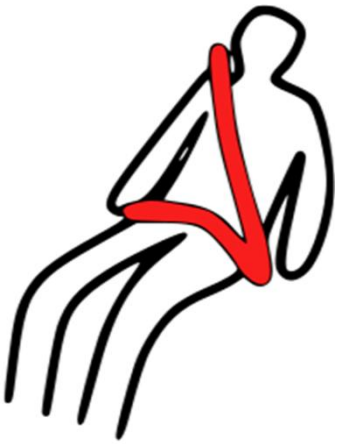
Spanish Law of Science (2011)

Omissions and bias in the content of research & innovation
Pregnant crash test dummies (from GI Project)

- Conventional seatbelts do not fit pregnant women properly, and motor vehicle crashes are the leading cause of fetal death related to maternal trauma. Even a relatively minor crash at 56km/h can cause harm. With over 13 million women pregnant across the European Union and United States each year, the use of seatbelts during pregnancy is a major safety concern.



"Sierra Sam," developed for the U.S. Air Force in 1949 to test ejection seats, represented the median height and weight of the 95th percentile adult male U.S. population.



The 3-point seatbelt was developed in 1959.

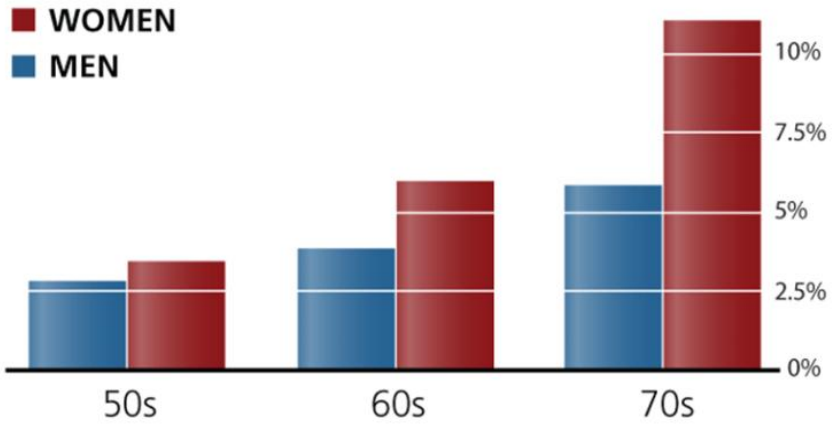
"Linda" by Volvo, a virtual pregnant crash-test dummy designed in 2002 by engineer Laura Thackray. "Linda" models the effects of high-speed impact on the womb, placenta, and fetus.

Gendered Innovations in Science, Health & Medicine, Engineering, and Environment

Omissions and bias in the content of research & innovation
Osteoporosis disease in men (from GI Project)

Osteoporotic Fracture Probability by Age and Sex

Risk shown for patients with T ≤ -2.5



Data from United Kingdom
Adapted from Kanis et al., 2008b

Osteoporosis in U.S. Women and Men

	WOMEN	MEN
Average Age of Onset	65 years	75 years
Lifetime Incidence of Osteoporotic Fracture	25%	13%
Fraction of Hip Fractures Due to Osteoporosis	70%	30%
Criteria Used to Diagnose	T ≤ -2.5 or Fragility Fracture	T ≤ -2.5 or Fragility Fracture

Data from Burge et al., 2007

Men account for nearly a third of osteoporosis-related hip fractures in Europe and the U.S. Nonetheless, osteoporosis is considered primarily a disease of postmenopausal women, and men are rarely evaluated or treated for it

Omissions and bias in the content of research & innovation
Osteoporosis disease in men (from GI Project)

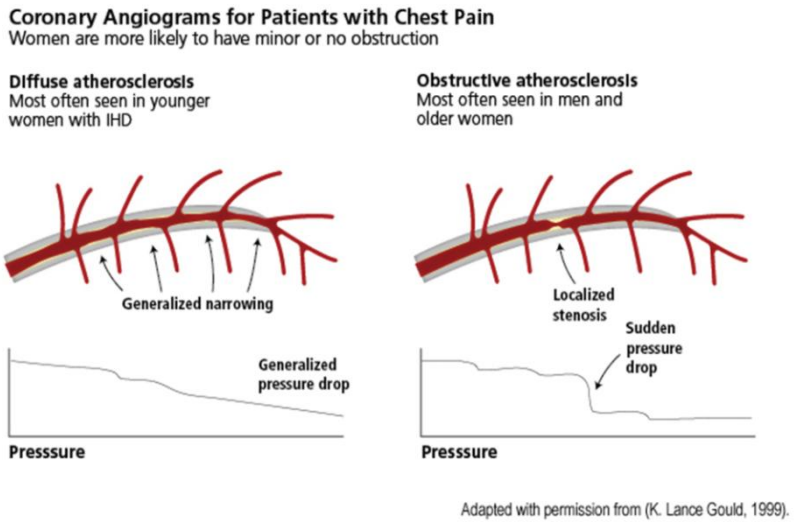


Table. Prevalence of "Normal" and Nonobstructive Coronary Arteries in Women Compared With Men

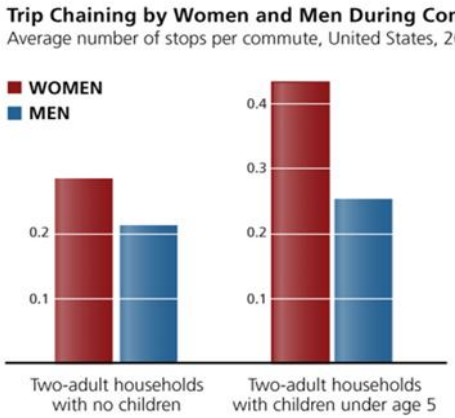
	No./Total (%)		
	Women	Men	*P* Value
Acute coronary syndrome			
GUSTO[2]	343/1768 (19.4)	394/4638 (8.4)	<.001
TIMI 18[3]	95/555 (17)	99/1091 (9)	<.001
Unstable angina[2]	252/826 (30.5)	220/1580 (13.9)	<.001
TIMI IIIa[6]	30/113 (26.5)	27/278 (8.3)	<.001
MI without ST-segment elevation[2]	41/450 (9.1)	55/1299 (4.2)	.001
MI with ST-segment elevation[2]	50/492 (10.2)	119/1759 (6.8)	.02

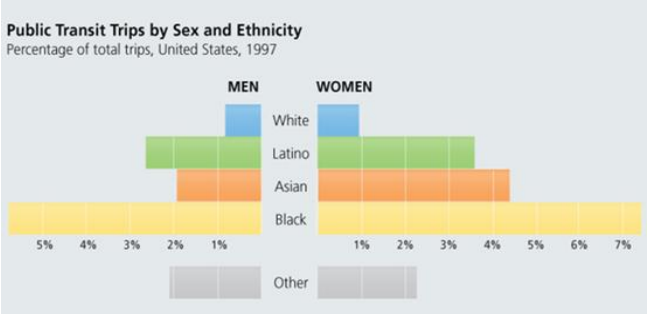
Abbreviations: GUSTO, Global Utilization of Streptokinase and t-PA for Occluded Coronary Arteries; MI, myocardial infarction; TIMI, Thrombosis In Myocardial Infarction.

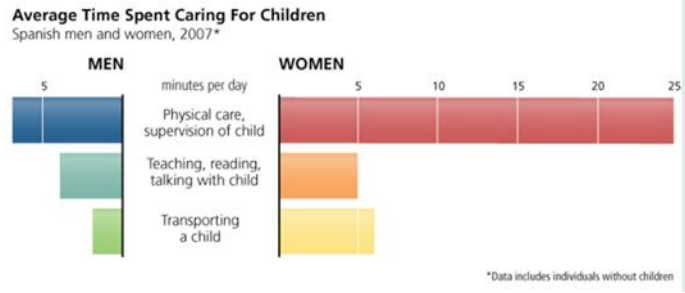
Table reproduced with permission from (Bugiardini et al., 2005).

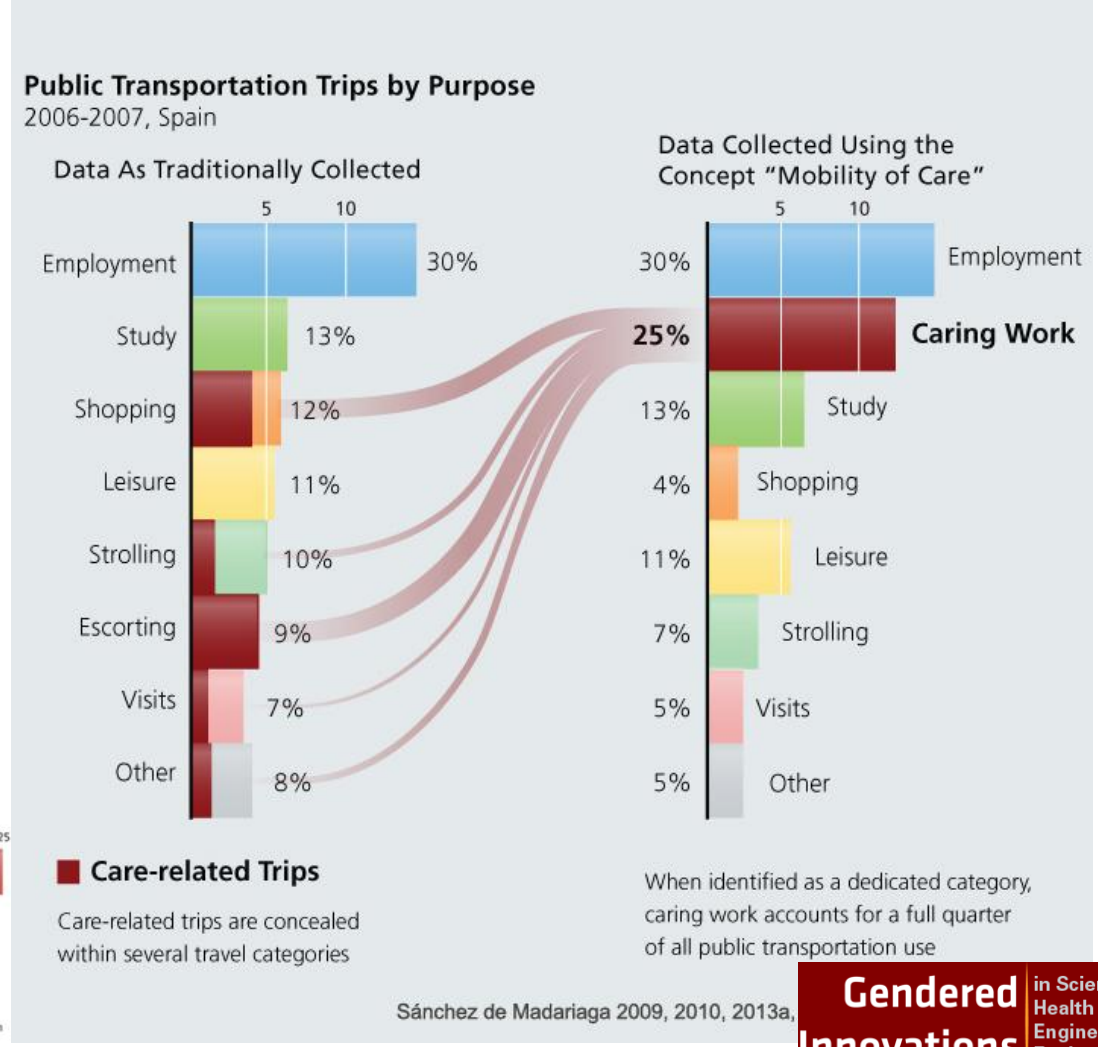
Heart disease is the number one killer of U.S. and European women. Nonetheless heart disease has been defined as primarily a male disease, and "evidence-based" clinical standards have been created based on male pathophysiology and outcomes. As a result, women are often mis- and under-diagnosed

A case study : introducing gender aware concepts in transportation: the « mobility of care »









RELEVANT RESOURCES ON GENDER AND SCIENCE

GenPORT
The world's best resources on gender and science

GenPort

www.genderportal.eu

Gendered Innovations in Science, Health & Medicine, Engineering, and Environment

Gendered Innovations

http://ec.europa.eu/research/gendered-innovations/

genderSTE
Science, Technology, Environment

genderSTE

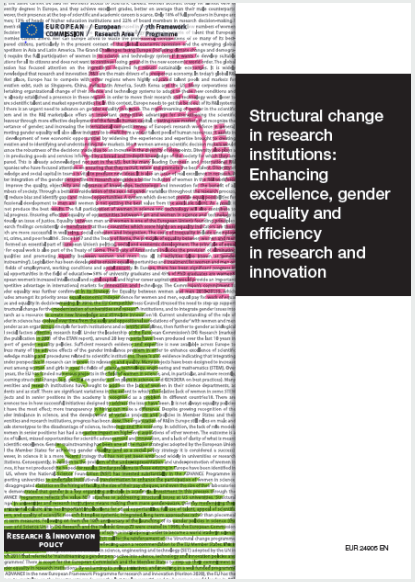
www.genderste.eu

Toolkit Gender in EU-funded research

http://www.idi.mineco.gob.es/stfls/MICINN/Investigacion/FICHEROS/El_genero_en_la_investigacion.pdf

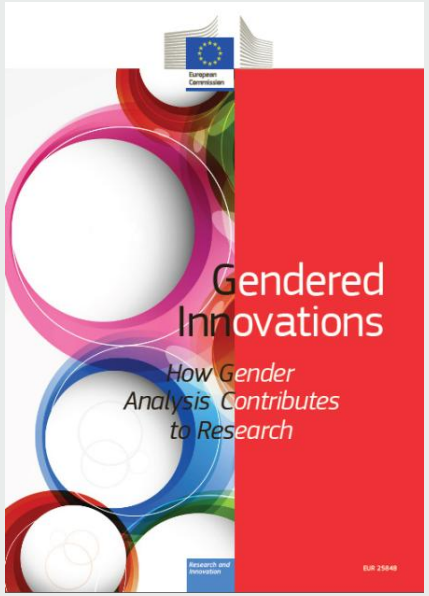
Publications of the European Commission

She Figures 2012



Structural Change in Research Institutions

http://ec.europa.eu/research/science-society/document_library/pdf_06/structural-changes-final-report_en.pdf



Gendered Innovations