From Evidence to Action through Dialogue and Consensus

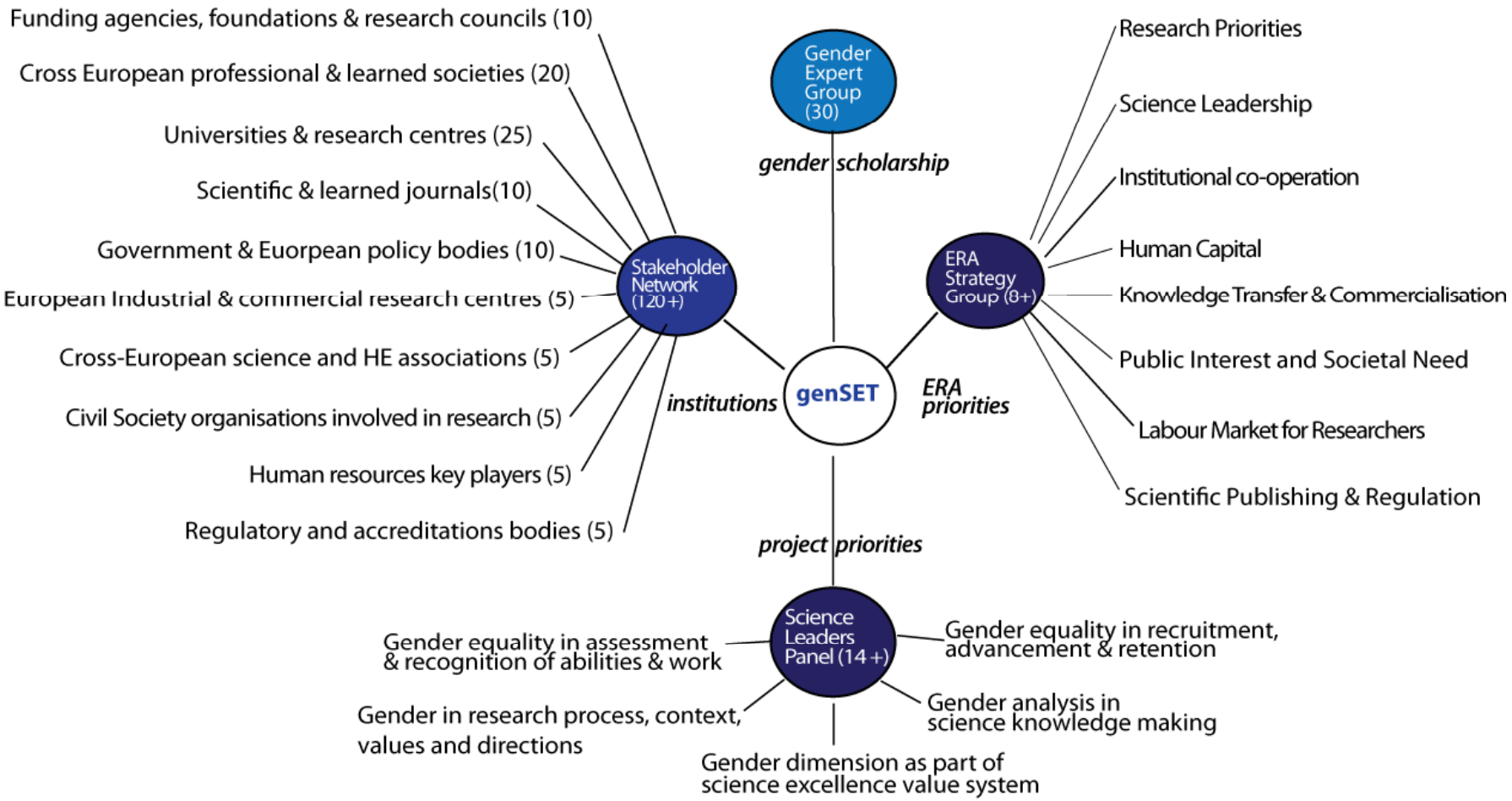
Achievements and lessons from the genSET project in advancing gender equality in science in Europe

Elizabeth Pollitzer, Director, Portia Ltd (genSET lead partner)

genSET Aims

- To introduce into the discourse on gender the voice of the scientists
- To raise awareness and transfer gender research evidence into all relevant types of science institutions
- To build capacity among 100 science institutions for mainstreaming gender
- To create dialogue involving all key stakeholders
- To create practical ways for designing and implementing gender equality action plans

genSET Targets



The Stresses in the Talent Pipeline

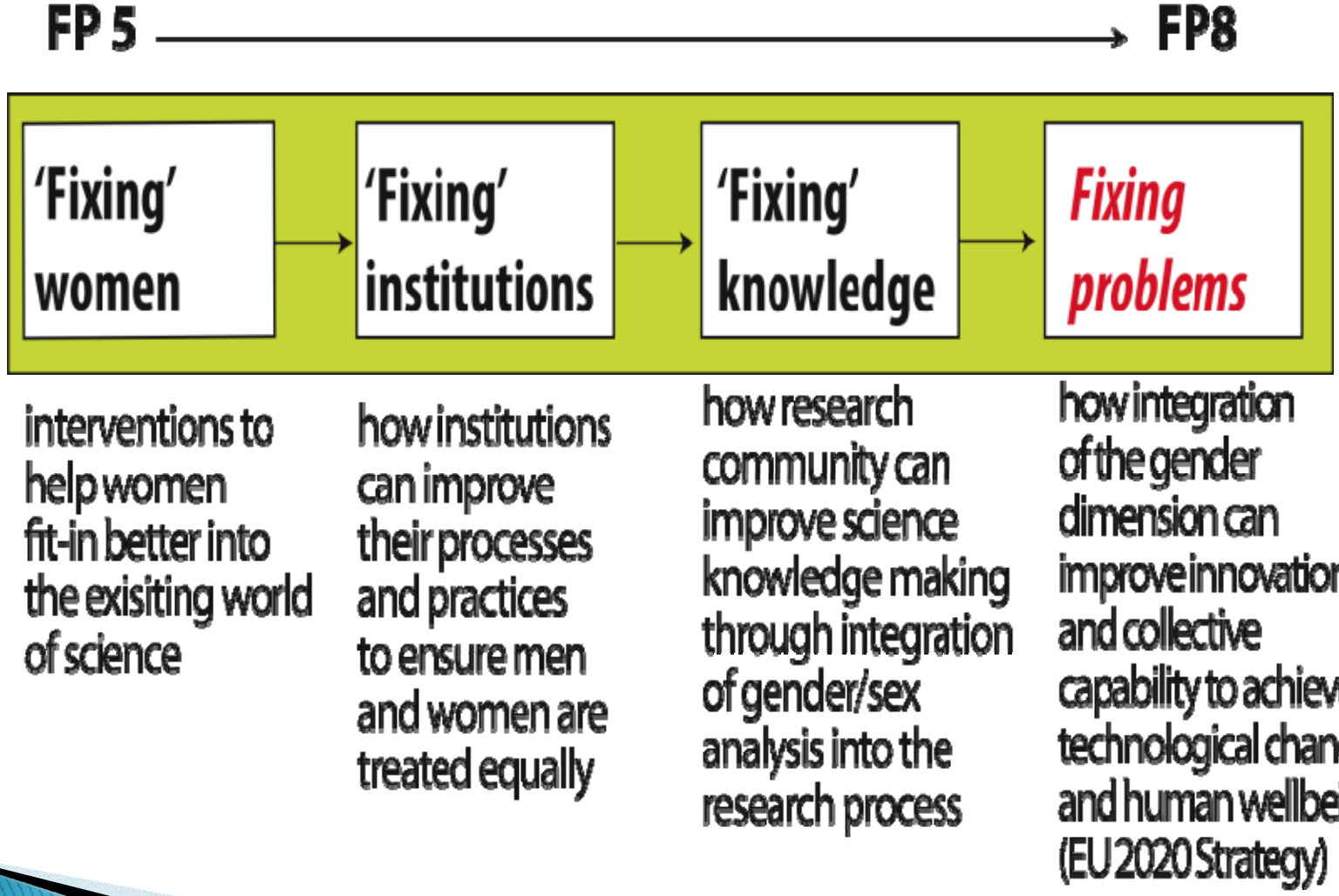
Proportions of men and women in a typical academic career, students and academic staff EU-27 2002 - 2006

5As: science gender stereotypes (Nosek);
5Ag: professor's gender (Carrell);
6s: interdisciplinary preferences (Rothen);
6g: collaboration strategies (Bozeman);
C: risk taking; teamwork (Byrnes, Dunbar);
B: assessment (Trix);
A: gatekeepers; leadership (Zinovyeva; McKinsey)

Treaty-level EU Commitments

- *"the inclusion of gender issues in the research is **a resource to create new knowledge and stimulate innovation**…this dimension should be taken into account while **modernizing research institutions** and in any structural and cultural change, designed to **improve the effectiveness and impact of the research itself**"*
  (Council of the European Union, 2010)
- Treaty of Rome, 1957 (focus on equality in employment)
- Treaty of Amsterdam 1997 (focus on gender mainstreaming across EC policies

EC-level Action through Framework Programmes *(criticized by evaluators)*



Male Norms, Gender Bias, Skewed Priorities, Underutilized Talent

- Pain
- Health
- Toxicology
- Vaccination
- Voice recognition
- Transport
- Energy
- Etc… etc.

- Decision-making
- Advising
- Communicating
- Leading
- Collaborating and Cooperating
- Performance
- Role Models vs Stereotypes
- Etc… etc.

A Quick A-Z (for non-gender experts)

The A-Z of why Gender Matters in Research and Innovation

genSET

This A-Z is a very brief introduction into the rich and extensive evidence that is available to demonstrate how gender shapes and is shaped in research and innovation. The examples were assembled by Dr Elizabeth Pollitzer from Portia Ltd, the Coordinator of the genSET project. It is hoped that they will communicate to policy makers discussing HORIZON 2020 Article 15, as well as the future of ERA, the benefits and opportunities of using the gender dimension as a stimulus for enhancing R&D&I. To obtain details of the sources used here, please send an email to info@portiaweb.org.uk.

A is for **Agreement** in the scientific community on the need to identify **appropriate animal models** (nonhuman primates, rats, mice, rabbits, swine, hamsters, gerbils, quail, and fish) that can be used *to screen for gender-based differences and be more predictive of the human experience*. A is also for advancing fair **assessment** of women's and men's scientific work, and for the already existing equality laws, for instance the **Amsterdam Treaty**, to be more diligently applied.

B is for **Biological sciences** where women tend to cluster. B is also for **biomarkers** as investigative and therapeutic tools with an *estimated market value of $26 billion*. Significant physiological differences hold between women's and men's biomarker profiles. B is also for **breast cancer screening** using technology *developed for mine detection*, thanks to both consisting of material with the same dielectric constant.

C is for **Cultures** in research and innovation that allow *8 out of 10 men advance to A Grade positions even though 50% of PhD degrees are granted to women*. C is also for **chicks**. *50 million are hatched each day in US alone* and the poultry industry would like an automatic way of separating female eggs/chicks from male. C is also for **crash** dummies that are based on a man's body, and **car** seat belts that have not been made for pregnant women.

D is for **Diversity** in teams and how it positively impacts on creativity and performance. D is also for prescription **drugs withdrawn** from the US market between 1997-2000, *8 of the 10 posed greater health risk for women than for men*. D is also for radiation **dosimetry** models, and improved biodosimetric techniques to assist in long-term effective epidemiologic investigations of *radiation cancer risks*.

E is for **Education of women** in European universities, with nearly 60% female graduates and increasing **employment rates**, which economists at Goldman Sachs described as a more effective social policy than quantitative easing. E is also for higher **environmental awareness** of women in the spheres of waste, consumption and mobility, and for **exclusion** of women from **energy economy**. E is also for gender -aware and fair **ERA**.

F is for **Fairness** in assessment and in access to opportunities: expert evaluators of **Framework Programme** said it did not advance women as much as men. F is also for **FoldIT** gamers. *57,000 of whom, with 30% women*, solved a protein structure problem that the scientists could not solve for the last 10 years. F is also for **French lawmakers** considering legislation that would require at least *40% of companies' boards* to be made up of women within six years or risk not being able to add *new* male directors.

G is for **Gender awareness** and **gender specific medicine**, which examines how normal human biology and physiology differs between men and women and how the *diagnosis and treatment of disease also differs between women and men*. Key areas of impact are cardiovascular disease, mood disorders, the immune system, lung cancer as a consequence of smoking, osteoporosis, diabetes, obesity, and infectious diseases.

H is for **History of the measures** taken over the last 20 years to tackle gender inequalities in science at EU and national levels, but *still less than 20% of women reach full professor positions*. H is also for **HIV/AIDS** epidemic, where gender plays an integral role in determining an individual's vulnerability to infection. H is also for **heart disease**: more women (1.5%) than men (1.1%) admitted to hospital die of heart attack within 30 days. H is also for **HORIZON 2020, Article 15**.

I is for **Innovation Union**, which should benefit women and men equally. I is also for collective **intelligence**, which *increases when there is gender balance in the group*, i.e. neither women nor men are in a significant minority. I is for **inclusive** ways to draw all creative talent to solve research and technological problems. Among the 25,000 problem solvers on www.innocentive.com, which broadcasts problems **industry cannot solve**, *women submitted better solutions* overall than men.

J is for **Justice** and equality policies. J is also for **journals**, such as The *Lancet*, *that have adopted editorial policy requiring authors to include information on gender aspects in their research reports*. J is also for **junior scientists** (graduate students and postdoctoral fellows), among whom women worry *much more than men that a science career will prevent them from having a family*: 29% of women but only 7% of men

K is for **Knowledge making in science**, where extensive research evidence is available to demonstrate a variety of *gender bias and gender related errors created by mistaken adoption of male as the norm, or exclusion of females from research design and context*. K is also for **knowledge transfer** from the labs to the markets and society, which should be responsive to the needs of women and men.

The A-Z of why Gender Matters in Research and Innovation

L is for **Leadership** styles, which differ between women and men; the presence of women *improves performance and cultures but there must be at least 30% of them so that they are seen first as co-workers and not as women*. L is also for **leaky-pipeline**, which captures the fact that fewer women than men succeed at each career step, and while 59% of women obtain a PhD degree, less than 20% gain Grade A position. *Fewer than 14% of heads of universities in Europe are women.*

M is for **Merit** based recruitment and promotion that prevents the effects of implicit gender stereotypes, gender bias and gatekeeper conditions to influence promotion decisions. M is also for factor career **models** that allow women and men to combine working in research with their life aspirations. M is also for new **markets** for science knowledge, which are gender aware, and where this knowledge is used to explore opportunities.

N is for **Norms** used in research, which are frequently 'male'. For example, our understanding of pain starts with the male rat: calculations of radiation dosage are based on an absorption model of a middle aged man. In most anatomy books majority of images are of a man's body. N is also for nanotechnology (**nanomaterials**, **nanotools**, **nanomedicine**) with the worldwide *sales revenues of $11,671.3 million in 2008*. Many current nano products have been targeted at women.

O is for **Organisational** structures, practices and cultures that are deployed in knowledge production and their influences are what is prioritised, how resources are allocated, who makes the decisions, how much collaboration there is. **L'Oréal** has shown that *labs are more productive, in terms of research papers and the patents produced, when they are gender balanced.*

P is for **Practices** in innovation and **patents** and **products** derived from scientific knowledge. Among the *submissions to the European Patent Office only 6% are from women*. A 2009 *Eurobarometer survey* showed that women are "*anti-innovation*" and "*reluctant*" *to accept innovation* - such views must be challenged. Research shows that female researchers in universities can produce patents at the same rate as their male colleagues when encouraged to do so.

Q is for **Quality** in research and innovation, which means knowledge that is free from gender bias and gender errors, which addresses women's and men's needs equally, and which does not put at a greater risk women (or men). Q is also for **quotas**, seen by many as the **quickest way** of fixing gender inequalities in careers and scientific systems.

R is for **Risk** and **attitudes to risk** that differ between women and men. In particular attitudes to cognitive risk. *Generally, women tend to minimize loss and men tend to maximize gain*. This means that gender balanced teams should be the best in research and innovation. Women's more cautious attitude to cognitive risk may explain why fewer apply for advanced **research grants** but are more successful than men, when they do.

S is for **Selection** decisions, which impact on people's careers and on research priorities and funding allocation. S is also for **stem cell** research, where breast milk is proving to be a reliable source of cells, and cells from female muscle tissue have shown better regenerative properties than those from male tissue. *The donor gender and the recipient hormonal milieu may explain gender-related disparities in clinical outcomes.*

T is for **Talent** of women, which is often valued as less important than men's. T is also for **transplantation** where *more women than men are donors but fewer receive or survive a transplant*. T is also for **toxicology**. Women have been excluded from many drug studies but our understanding of toxic effects is based on such (male) studies. **Toxicokinetic differences** mainly involve metabolism, but in addition, lifestyle, psychosocial, and hormonal factors modify the kinetics and responsiveness, so both sex and gender factors can play a role.

U is for **Unexpected findings** in research, which happen often, to which female researchers tend to respond in a different way to the way that male researchers do. *Women tend to probe more deeply to explain the reasons for the unpredicted results, men tend to change methodological strategy*. Research would benefit if it **utilises** these leanings by promoting gender balanced research and innovation teams.

V is for **Valorisation** of useful connections between disciplines, for example through Networks of Excellence, such as **FrontiersHLife**, which can act as a *bridge between the fields where women are underrepresented, such as photonics and where they are in a majority, i.e. life sciences*. The biophotonics market has been **valued** at $63 billion. Knowledge of the biological differences between women and men, and of their preferences can increase opportunities for using scientific knowledge in a multidisciplinary way.

W is for **Womanomics**. Globally, women control about $20 trillion in annual consumer spending, but they are undervalued and underutilized in the market place. W is also for **World Economic Forum Gender Equality Index**, which shows that the most successful countries are those that have in place strong gender equality policies.

Y is for **Young Investigators** and the innovative ways in which women can be supported and advanced in research through EU measures such as *Marie Curie Actions*, and at national-level through initiatives such as **Young Investigator Network** at the Karlsruhe Institute of Technology, or **ERC Young Investigator Lecture Grant**, which can be made, if needed, more gender aware.

Z is for **Zero-tolerance** of gender inequalities in research and innovation - the best strategy for giving women the same opportunities to participate in and benefit from the scientific enterprise, as men.

NSF 2nd April 2012

But still…Leaders Must Be Convinced

"I am supporting my students in science, regardless of gender. I am convinced that equal opportunities for anybody regardless of gender, race or social background are essential for a democratic society. But I don't see that my work is related to gender. Is biomedical and mathematical research related to the gender of the person who does it? I can't see this. Its related to excellence and intrinsic interest. This can be women, man, black, white or asian people. It doesn't matter. ***Only excellence matters****."*

Best Strategy: through Gender Research Evidence & Scholarship

Prof Londa Schiebinger

Prof Teresa Rees

Prof Judith Glover

Prof Alison Woodward

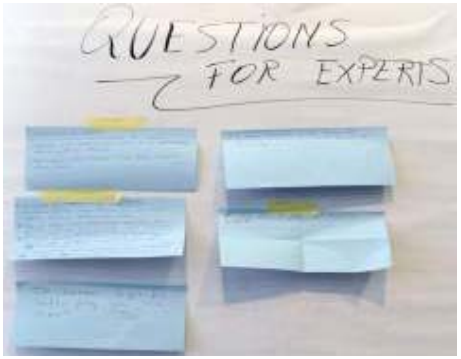
120 empirical studies and research reports

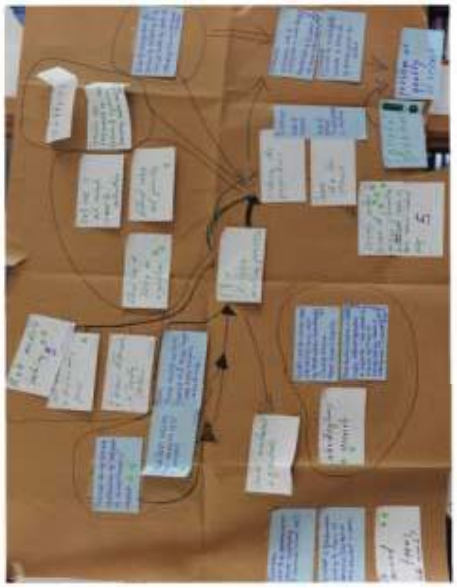
Research briefing documents for science leaders

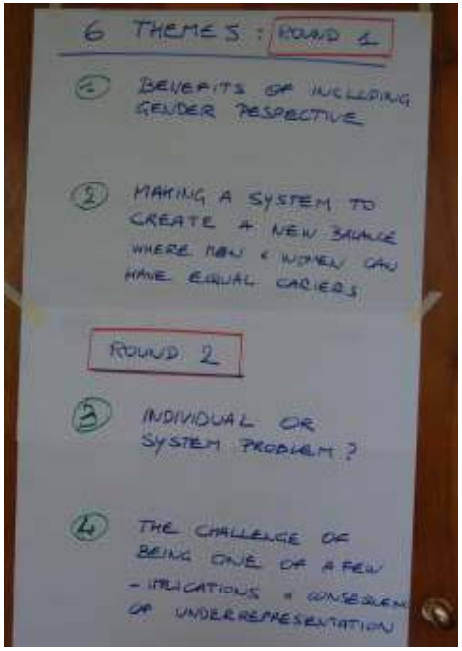
Best Strategy: through Highest-level Institutional Support – genSET Patrons

(? EIT, EUA, ALLEA, EIRMA?)

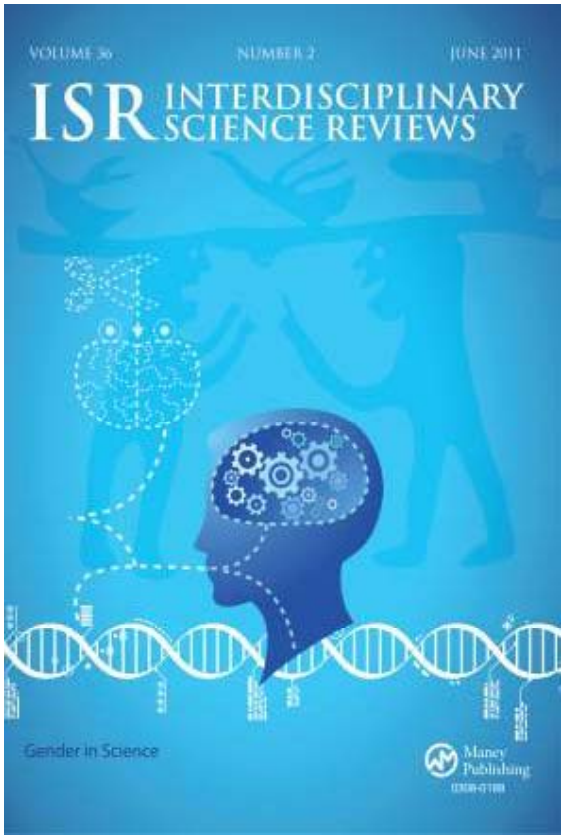
Best Strategy: through Consensus of Science Leaders





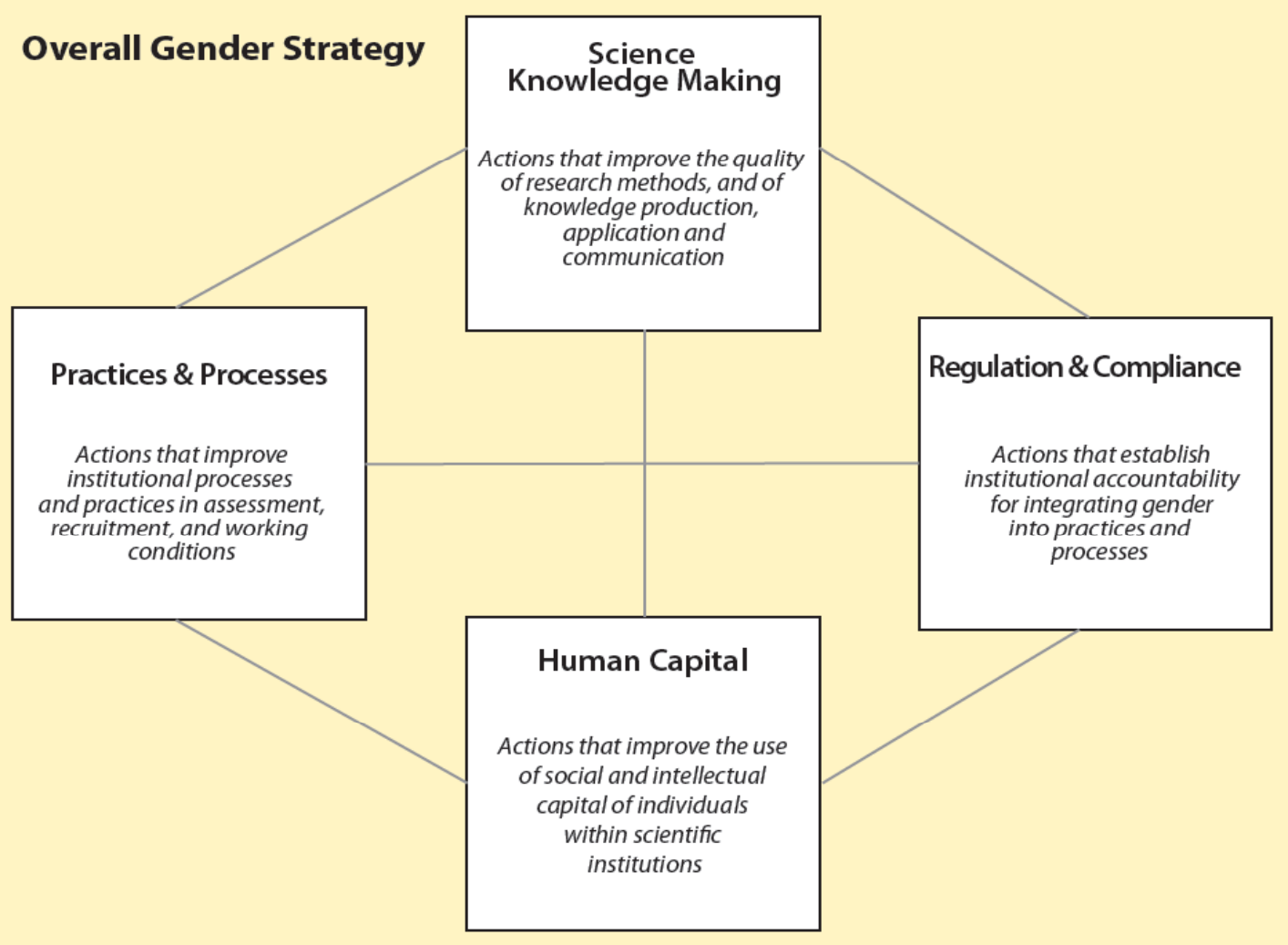


Best Strategy: through Recommendations
from science leaders for science leaders



Best Strategy: through Ownership by Scientific Community

Best Strategy: through Clear Four Priority Areas



Best Strategy: through Proper Response to Stakeholder Diversity

- National and regional (e.g. Nordic countries vs Italy and Poland)
- Cultural (hierarchical vs autonomous)
- Success in obtaining research funding (e.g. LERU)
- National gender equality regulation (e.g. UK, Spain) and measures (e.g. quotas in Norway)
- Acceptance of gender equality action plans as management tool

Best Strategy: Making Leaders in the Science System the Agents of Change

Best Strategy: Making Editors of Science Journals the Agents of Change

Editorial

Women in science - what's the world missing?

THE LANCET

NSF 2nd April 2012

Best Strategy: Making Research Funders the Agents of Change

- Research Council Norway
- Vinnova (Sweden)
- SNF (Switzerland)
- DFG (Germany)
- ERC (Europe)
- HORIZON 2020
- NIHR (UK)
- NSF (USA)

Best Strategy: Making the Scientists the Agents of Change

- The EC Green Paper on the future of R&D funding in Europe public consultation – Q24: How women's role should be strengthened
- The genSET Gender Summit public consultation – Q24 expanded into a series of specific issues in research and innovation
- Review of results by attendees at the Summit
- Outcome: **Manifesto for Action on the Gender Dimension in Research and Innovation**
- 3000 scientists signed in the last 3 months (Manifesto was presented to the Commission, launched on-line, and sent to all MEPs)

Best Strategy: Making Policy Makers the Agents of Change

Presenting the Manifesto to the Commissioner for Research, Innovation & Science

(ex) Vice-president European Parliament

(ex) Secretary of State Ministry of Science, Poland

Members of influential committees at the European Parliament/

HORIZON 20202 rapporteurs

Ability to Respond to Policy/Political Concerns

- Innovative, inclusive and secure societies
- Social benefit from science
- Research in all Member States
- Cooperation between private sector, SMEs, and public bodies
- Smart specialization and exploitation of scientific knowledge
- Economic and societal impact of research
- **Research and innovation landscape that is excellent and efficient**

New Opportunity: HORIZON 2020 (Article 15) and ERA

- *"The activities developed under Horizon 2020 should aim at promoting equality between men and women in research and innovation,* ***by addressing in particular the underlying causes of gender imbalance, by exploiting the full potential of both female and male researchers, and by integrating the gender dimension into the content of projects in order to improve the quality of research and stimulate innovation****"*

" a small number of 'big ticket' items which are crucial for achieving ERA and will make the biggest impact on the economy. Fair, transparent, merit based recruitment, for instance. Or specific measures to support women's scientific careers. More grant mobility…"

Best Strategy: Sharing knowledge and experience, cooperation between US-EU

- ADVANCE programme *(transferability issues)*
- Work-life balance/work conditions (*important to focus on issues relating specifically to science, e.g. travelling to conferences, lab experiments, etc)*
- Joint grant review panels
- Gendered Innovation project (*Stanford*)
- More flexible research career models (*cross-disciplinary, cross-sector*)
- ERA and mobility of research workforce *(postdocs, retirement)*
- ERC synergy grants *(linking talented individuals)* and results on gender factors in researcher's careers *(1-year study expected to start in 2013)*

2nd Gender Summit, 29-30 November: platform for high level dialogue

- 1st Gender Summit (November 2011, Brussels) was a great success as a high-level platform for bringing together key stakeholders in science system
- 2nd Summit planned to take place at the European Parliament, Brussels (where the proposed HORIZON 2020 framework is currently being debated)
- Focus on:
  - Article 15 – how to align policies and operationalize gender equality objectives
  - ERA – gender as 'big ticket' for improving excellence and effectiveness
  - Research evidence for integration of gender in research content
  - Gender Quality Standard for self-testing capacity to mainstream gender and implement best practice

Conclusions 1

- The 'business case' for Action is supported by:
  - extensive and persuasive gender research evidence showing both the consequences of the inequalities and benefits of changes on quality of science systems and work
  - systematic, foresight type/scenario building overviews to support mission-oriented problems (health, aging, environment, energy, etc) would be useful
  - the genSET strategy, and availability of expertise in US and EU, can effectively help 'agents of change' to include gender issues in their professional/political agendas
  - participatory methods/platforms such as the Consensus Seminars and the Gender Summit stakeholder involvement, dialogue and consensus building

Conclusions 2

- Excellence and effectiveness can be enhanced by:
  - Adopting novel approaches to gender imbalance across fields, e.g. linking photonics and life science, biology and mathematics, engineering and physiology/psychology; toxicology and biology; security and biology; energy and environmental sciences, etc.
  - Research funders and research publishers requesting information on the role and relevance of the gender dimension as a condition of acceptance
  - Improving the role and capability of R&D HR
  - Making 'idea to innovation cycle' more inclusive, e.g. through 'crowd-sourcing' (InnoCentive), and including women as co-producers of ideas (Fraunhofer)

THANK YOU Very Much

- For background information on genSET please see http://www.genderinscience.org
- To learn about Gender Summit please see http://www.gender-summit.eu
- To learn about Portia please see http://www.portiaweb.org.uk
- For any follow-up questions please send email to ep@portiaweb.org.uk