

Gendering knowledge in research organisations and higher education: The case of the medical sciences

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While gender mainstreaming in research has been systematically supported at the institutional level, most especially by the European Commission through its funding schemes, less attention has been drawn to academic teaching. However, gendering education is an equally essential pillar to take care of, given that it is in universities that future researchers and scientists are currently educated and trained. Focusing on the case study of medicine, this paper aims to give an account of what a gender-blind approach to science is, and what biases it entails at different levels of biomedical practice, from knowledge production (research) to its transfer (the clinic) and teaching (education and training). To do so, an interdisciplinary literature review—ranging from the health to the social sciences—has been undertaken with the aim of constructing a conceptual framework that could help to map and classify the various forms of sex and gender bias in medicine. A few good international practices aimed at debiasing academic curricula in medical schools will be described as well. In this regard, the efforts made in the domain of higher education remain fragmented and limited to a single country or organisation-based initiatives, while a more systematic approach should be encouraged.

KEYWORDS: *gender bias, gender medicine, medical education, gender mainstreaming, gender equality.*

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Introduction¹

The inclusion of a gender perspective in research, teaching and knowledge transfer is one of the objectives of the European Research Area (ERA) and has become a quality

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criterion of the major research funding instruments of the European Commission (EC). The European case is interesting because—unlike what has happened in other contexts—the European Union has chosen to connect efforts aimed at introducing the gender perspective in research content to those aimed at promoting gender equality in higher education and research organisations.

The acknowledgement of the existence of gender inequalities among researchers and the reflection on the gendered assumptions of scientific knowledge are brought together by drawing on the traditions of science and technology studies (STS), exposing the social dynamics of the scientific enterprise, and feminist epistemology, highlighting the impact of power differentials, the situated nature of knowledge, and the heuristic positions of marginalised subjects in science.

By focusing on the case study of medicine, this paper aims to provide an account of what a gender-blind approach to science is, and what biases it entails at different levels of biomedical practice, from knowledge production (research) to its transfer (the clinic) and teaching (education and training). To do so, an interdisciplinary literature review—ranging from the health to the social sciences—has been undertaken with the objective of providing a conceptual framework that could help to map, identify and classify the various forms of sex and gender bias that threaten the accuracy of biomedical practice.

The paper is divided into three main sections: the first reconstructs the critical debate around the supposed neutrality of science, drawing from the STS tradition and feminist epistemology. The second section reports the results of the literature review to map the various forms of bias in medicine. The third part focuses on the policy level by giving an account of existing practices of gendering medicine, with a specific emphasis on higher education.

1. The practical relevance of feminist epistemology for inclusive research and teaching

The inclusion of a gender dimension in the content of research is a hallmark of gender equality programmes funded by the EC and a sustained focus of its major funding instruments since the 2007-2013 Seventh Framework Programme for Research (Palmen *et al.*, 2012), with an increasing emphasis on the Horizon 2020 (2014-2020) and now in Horizon Europe (2021-2027). In addition, devoted programmes such as ‘Gendered Innovations’ (Schiebinger *et al.*, 2021), in cooperation with Stanford University, were implemented to support studies applying sex and gender analysis throughout the research process.

The approach of Horizon Europe is grounded in the 2015-2020 European Research Area Roadmap (EC, 2012) standing for the double need to pursue ‘Gender equality and gender mainstreaming in research’. The association between gender equality in research (advocating for equal opportunities for female researchers) and gender mainstreaming in research (entailing the inclusion of the gender dimension in the very content of research) represents a *unicum* with respect to other structural transformation programmes such as the ADVANCE programme in the US, funded by the National Science Foundation, or the Athena SWAN in the UK, both of which focus only on the first of the two aspects.

This double-edged approach is underpinned by two connected theoretical and epistemological strands: (1) STS, exposing the inherently social fabric of the scientific enterprise (Kuhn, 1962; Bijker *et al.*, 1987); and (2) feminist epistemology,

highlighting the situated, embodied nature of knowledge (Haraway, 1988) and technology (Wajcman, 1991) and the heuristic position of marginalised subjects (Harding, 1986).

Within the STS debate, the changes science is currently undergoing have led scholars to talk of a passage to ‘post-normal’ (Funtowicz, Ravetz, 2003), ‘post-academic’ (Ziman, 1996), ‘Mode 2 science’ (Nowotny *et al.*, 2003), and ‘neo-liberal’ (Slaughter, Rhoades, 2000) academia. Features of these changes include weakening boundaries among disciplines, an increasing focus on the economic outcomes of research, and intensifying science-society relationships (Bijker, d’Andrea, 2009).

Many of these issues resonate in feminist epistemology, painting a complex picture of the relationship between research and teaching activities. The rise in importance of intersectional considerations beyond the gender binary divide (Crenshaw, 1990) is part of this process, resulting in an increased focus on epistemic inclusiveness (Knorr Cetina, 1999; De Vita *et al.*, 2016). Feminist epistemology is therefore at the forefront of the experimentation of trans-epistemic practices, which call for the identification and management of intersectional power dynamics in research, teaching and training (Ferguson, 2019).

In regard to research, the tendency to acknowledge the relevance of the social context of knowledge production translates into Nielsen and colleagues (2018)’s three main areas of action: (1) diversity in research teams to integrate the perspectives of differently situated persons; (2) diversity in research methods, incorporating sex and gender or intersectional analysis in research and teaching design (Schiebinger, 2021); and (3) diversity in research questions, entailing the integration of different research priorities and agendas.

The relative importance of these three areas is variable according to the scientific field concerned. In general terms, the social sciences are in principle equipped to deal with the influence of power differentials and exclusion on knowledge production and transfer. Not only does the sociology of knowledge focus on the relationship between science and its social circumstances, but one of the most traditional areas of study in the social sciences is—through different means and emphases—the unravelling of implicit power structures. All three areas of analysis and actions mentioned above are therefore clearly applicable.

In the natural sciences, particularly in more abstract disciplines, while the first area (diversity in research teams) is generally less controversial (even if not consistently practised), the second and third (diversity in research methods and questions) can be less immediately relevant and/or meet greater scepticism. However, it is increasingly documented, even in these fields, that gendered assumptions, in continuity with underlying power dynamics, affects knowledge production (Martin, 1991). Among the more relevant aspects: the selection of what are to be considered relevant scientific problems; the selection of what counts as relevant concepts for analysis; the formation of a hypothesis; the design and aim of research; what counts as evidence; the collection, selection, sorting, and interpretation of data; decisions about when to stop research; the conclusions drawn; and the way findings of the research are reported (Cipriani, 2020).

It is in strongly interdisciplinary fields, however, focusing on complex problems (Perz, 2019), that all three areas of analysis and actions for gender and intersectional inclusiveness appear extremely relevant. Fields such as environmental studies or the health sciences, for example, are dense with social, political and economic dynamics. In such contexts, epistemological awareness of the cognitive weight of equality and

diversity has practical relevance, enhancing research teams' capacity to address problems by introducing different perspectives and standpoints (Everett, Jamal, 2004).

The medical sciences addressed in this article are thus an interesting case study to focus on, presenting an extremely broad set of potential inequality situations and biases, both in research and in teaching, as well as at the professional level and in interactions with patients.

2. The case of medicine: Gender bias in research, the clinic and teaching

Feminist scientists and epistemologists have helped to cast a shadow on the supposed neutrality of the medical sciences by highlighting the limits of the male-standard patient, considered as standard value in research and clinics thus reproducing biases at different levels (Oertelt-Prigione, Regitz-Zagrosek, 2012).

In this regard, the debate is extremely heterogeneous in both terms and concepts, and several models have been proposed to account for the different types of gender biases in medicine (Ruiz, Verbrugge, 1997; Risberg *et al.*, 2009)². A way to efficiently disentangle the scholarship is to distinguish—by adapting the models of Ruiz and Verbrugge (1997) and Risberg *et al.* (2009) in light of the blindness versus stereotyping dichotomy proposed by Hamberg (2008), Verdonk *et al.* (2009), and Marcum (2015)—between two forms of bias:

- Gender blindness, by assuming equality between women and men when in reality there is none; that is, by assuming that diseases' risks, symptoms and progression are equal for men and women³.

- Gender stereotyping, by viewing gender differences where there are none; that is, by processing clinical evidence on the basis of faulty beliefs about a patient's illness based on his or her gender and so by wrongly incorporating the patient's gender into diagnosing and treating.

Both blindness and stereotyping can occur at different levels, leading to inaccurate results, low generalisation, and low quality of care. In this respect, the literature is not always consistent in the use of terms. Figure 1 portrays an attempt to summarise the findings of the review by identifying three broad levels of bias reproduction: research, the clinic, and teaching. Each of them refers to a specific epistemological *locus*: research organisations, healthcare providers, and higher education institutions or medical schools.

In the next pages, we will report the various types of sex and gender bias described in the biomedical literature by using the blindness-stereotyping dichotomy and distinguishing among three levels or dimensions (of the biomedical practice) in which they occur: research, the clinic, and teaching.

² The first classification of gender biases in medicine was proposed by Ruiz and Verbrugge (1997) with their model based on the opposition between equality (the bias assuming gender equality where there is none) and difference (the bias assuming gender difference where there is none). Following their work, Risberg and colleagues (2009) identified two dichotomous "axes" producing biases: sameness/difference and equity/inequity. At the same time, Hamberg (2008) listed different types of gender biases including "gender blindness" and "stereotyped preconceptions", while the term "gender stereotyping" has been used by Verdonk and colleagues (2009) and Marcum (2015).

³ The term 'gender blindness' is used here in a very specific way: to describe a specific form of bias leading researchers and clinicians to ignore gender differences. In this sense, it should not be confused with the abovementioned expression 'gender-blind approach to science', which refers to a broader, more common use of the same term; that is, the lack of a gender perspective in medicine, which is at the foundation of the two types of bias mentioned in this section.

FIG. 1—Gender bias in medicine

2.1 Gender bias in research

Gender bias in research occurs in the design, in the choice of subjects (cells, animals and humans) to be included in the study, and in the way data are analysed and reported.

At the preclinical level, the male sex prevails in the study design, thus affecting the generalisation of the findings (Franconi *et al.*, 2015). According to Ortona *et al.* (2016), given that more than 95% of studies conducted on animals include only male subjects, and in more than 20%, the sex of the animal is not specified (Ortona *et al.*, 2016). Furthermore, the *in vitro* experimentation field shows us that the sexual origin of the isolated cells is considered a negligible issue in more than 99% of works (Ortona *et al.*, 2016).

At the clinical level, one of the most cited examples refers to drugs: up until the 1990s, drug trial protocols were allowed to include men only (Grego *et al.*, 2020). This has prevented the design of products accounting for women's specific characteristics with consequences for their health: out of the 10 drugs withdrawn from sale in the US between 1997 and 2000 because of their lethal potential, eight were more harmful for women than for men (Schiebinger *et al.*, 2016).

At both the preclinical and clinical levels, the unequal representation of male and female subjects has long been justified by the need to reduce the impact of the oestrous cycle (Sugimoto *et al.*, 2019). At the clinical level, women's exclusion has also occurred in response to the idea of protecting their safety during childbearing age (Baird, 1999; Tannenbaum, Day, 2017). Moreover, the protocols of clinical trials are considered to be in conflict with family responsibilities, which are often held by women as long as trials entail long periods under clinical supervision (Seeman, 2010). Women are excluded thus making gender differences invisible (gender-blindness). At the same time, their invisibilization is strictly connected to gender stereotypes: by assuming that participation in trials cannot be reconciled with care work, and by assuming that all women must necessarily be wives or mothers.

Gender bias in research can occur not only in data collection, or through the exclusion of female subjects in different experimental phases, but also in the analysis and reporting of results by overlooking gender differences in the findings (even when female subjects are included in a study). By analysing 11.5 million papers published on Web of Science and PubMed through bibliometric techniques, Sugimoto *et al.* (2019) found that only 31% of publications included a sex and gender analysis. On the other hand, sex-related reporting rose from 59% in 1980 to 67% in 2016 in clinical medicine, and from 36% to 69% in public health research in the same time range. However, no increase in the biomedical research was observed (Sugimoto *et al.*, 2019).

With the aim of exploring the relationship between the author's gender and gender/sex reporting in the paper, Johnson *et al.* (2014) found that female PIs were more likely than men to indicate that their projects involved either sex (39% of women, 26% of men) or gender (25% of women, 12% of men). Nielsen *et al.* (2017) and Sugimoto *et al.* (2019) produced similar results. On the other hand, sex- and gender-sensitive papers are more likely to be published on low journal impact factors (Sugimoto *et al.*, 2019).

These latest outcomes are particularly interesting, as they shed light on the situated nature of knowledge production underscored by feminist epistemologists (Haraway, 1988; Harding 1993). From this perspective, the pursuit of gender equality in research institutions, including (but not limited to) diversity in teams, is functional and supports the quest for a greater diversity in methods and questions (Nielsen *et al.*, 2018), entailing (but not being limited to) the inclusion of the gender dimension in research.

2.2 Gender bias in clinics

Sex/gender bias in clinical practice occurs in diagnostics and treatment. In both cases, it can be due to the physician's diagnostic error (Norman, Eva, 2010) and/or to stereotyping dynamics that take place during the interaction between the patient and the physician (Elderkin-Thompson, Waitzkin, 1999).

Men are treated more extensively than women with equal symptoms in a variety of diseases (Hamberg, 2008; Mauvais-Jarvis *et al.*, 2020). At the same time, sex and gender differences in symptoms are sometimes neglected (gender blindness). For example, heart failure contributes to coronary heart disease mortality in women to a greater extent than in men, potentially due to undiagnosed ischaemic heart disease (Millett *et al.*, 2018). This may be due to women's greater heterogeneity of symptoms compared to men, among which 'standard' pain in the back is more common (Springer *et al.*, 2012). Differences refer to both sex and gender aspects. Women are more likely to develop this form of heart disease because of their serum progesterone level (Nilsson *et al.*, 2009). At the same time, behaviours, lifestyles, and psychological aspects related to their role in society and in the family, including a general increase in work-life conflict following women's entry into the labour market, may contribute to exacerbating risk factors (Regitz-Zagrosek *et al.*, 2016).

In addition to blindness, stereotyping occurs when physicians are more inclined to read men's symptoms as biological and women's as psychological (Colameco *et al.*, 1983; Claréus, Renström 2019). In their review on gender bias in the treatment of pain, Samulowitz and colleagues (2018) found that the pain reported by women is more often considered a consequence of a state of psychological alteration and is therefore underestimated (Tait *et al.*, 2009). On the other hand, men are underdiagnosed as well in regard to depression, so much so that the symptoms of male depression do not appear in the DSM manual (Call, Shafer 2018).

Sex and gender biases in diagnosis and treatment are reproduced in clinical guidelines. In their review on the role of sex and gender differences as modifiers of the cause of death and morbidity, Mauvais-Jarvis and colleagues (2020) revealed that many guidelines and protocols are not gender- or sex-specific, as with diabetes or heart failure. Even when sex and gender evidence-based data are available, they often do not provide sex-based practice recommendations or health-system protocols (Mauvais-Jarvis *et al.*, 2020).

2.3 Gender bias in teaching

Gender bias in teaching is reproduced in medical textbooks' language and representations (Martin, 1991; Dijkstra *et al.*, 2008; Parker *et al.*, 2017) and in academic curricula, through the absence of gender-related content in classical courses and the absence of special courses on gender medicine (Jenkins *et al.*, 2016).

With regard to textbooks and analysing the most commonly used medical textbooks in US academic institutions, Martin (1991) discovered that most of the words chosen to describe the anatomy and biological processes of human bodies are ‘scientific fairy tales’ or social constructions. Examples include reproductive functions:

It is remarkable how ‘femininely’ the egg behaves and how ‘masculinely’ the sperm. The egg is seen as large and passive. It does not move or journey, but passively ‘is transported, ‘is swept,’ or even ‘drifts’ along the fallopian tube. In utter contrast, sperm are small, ‘streamlined’, and invariably active. They ‘deliver’ their genes to the egg, and their tails are ‘strong’ and efficiently powered (Martin 1991: 489).

The egg and sperm example is a form of gender stereotyping insofar as stereotypical female and male characteristics, such as being passive and active, are used to describe a cellular process. Other studies point out the presence of forms of gender blindness in anatomical images. In this respect, Giacomini and colleagues found that the majority of the representations in anatomy textbooks depict male body parts (Giacomini *et al.*, 1986). Two more recent articles indicate similar results in textbooks used in French and Welsh medical schools (Morgan *et al.*, 2014) and in Australia (Parker *et al.*, 2017).

With regard to curricula, the literature suggests the prevalence of forms of gender blindness through the absence of gender-oriented courses and the absence of special courses on gender medicine. Miller and colleagues found that 70% of 44 medical schools surveyed did not have a formal sex- and gender-specific integrated medical curriculum (Miller *et al.*, 2013). In a US study conducted among medical students, Jenkins and colleagues discovered that out of more than a thousand participants, the majority (63%) agreed that the content in their curriculum was primarily related to males (Jenkins *et al.*, 2016). In Italy, according to a recent survey distributed to medical faculty, 80% of Italian medical schools did not have a gender medicine course (Biancheri, Mascagni, 2018).

The possibility of experiencing a ‘biased’ medical curriculum also depends on the presence of professors and trainers who are unaware of the importance of the gendered approach to clinical and research practice, although they may not be opposed to its value. A qualitative research study conducted in Sweden investigated the attitudes toward gender issues of male educational leaders in six medical schools (Risberg *et al.*, 2011). The results showed that all the participants had the ability to articulate what gender issues are and why they matter in medicine. However, most of them argued that gender-related issues are not part of the training because of their unscientific content (Risberg *et al.*, 2011).

3. Gendering knowledge in medical education: Policies and practices

Gender biases occur in biomedical research, the clinic, and teaching. The three levels are intertwined, and for this reason, interventions aimed at gendering medicine cannot help but be but multileveled. However, while the inclusion of gender in research has received systematic support by means of supranational funding schemes, including the EC’s framework programmes, actions aimed at addressing teaching—both in higher education and in professional training (with direct consequences for clinics)—have not received the same attention (Ferguson, 2019). This may also be because, unlike many research funding bodies, both higher education systems (in terms of their educational offer) and healthcare systems are regulated at a national level. For this reason,

interventions are more heterogeneous and related to single organisational/single country initiatives.

Actions aimed at redesigning medical curricula by modifying the content of classical courses and/or by introducing thematic courses on gender medicine have been implemented since the 2000s (Miller *et al.*, 2016; Ruiz-Cantero *et al.*, 2019). Important initiatives have taken place in the Netherlands (Verdonk *et al.*, 2005), Canada (Zelek, 1997) and, more recently, in the US (Miller *et al.*, 2016) and other European countries, including Sweden, Germany and Austria (Ludwig *et al.*, 2015).

These initiatives reflect epistemological and feminist considerations on scientific education, suggesting the need to develop doctors' critical thinking to overcome gender biases (Marcum, 2015), while enhancing their reflexive and empathic capacities to better understand the power dynamics between professionals and patients (Sharma, 2019). Given this context, the development of new teaching methodologies is crucial.

In this regard, the Dutch case represents a turning point in the international political agenda. In 1998, Verdonk and colleagues launched a pilot study to screen the content, materials, and curricula at the Radboud University Nijmegen Medical Centre (Verdonk *et al.*, 2008). While showing how most of biomedical topics and educational content were gender blind, they listed the factors favouring, in their view, a gendered approach in medical schools. These factors include adequate resources (both time and money), efficient evaluation mechanisms, gender training for teachers, and political and institutional support (Verdonk *et al.*, 2005). In 2002, the project was extended nationwide, resulting in a list of recommendations, a digital platform for medical teachers, and training courses for all professionals and staff (Verdonk *et al.*, 2008).

The Dutch model inspired other European contexts, including the Charité University of Berlin, home to the largest medical faculty in Europe, which, since 2010, has been offering a new gendered medical curriculum that includes courses on gender medicine and the mainstreaming of sex and gender medicine-related aspects into other subject courses (Ludwig *et al.*, 2015). Further experiences include the adoption of a gender-sensitive medical curriculum at Innsbruck Medical University in Austria (Hochleitner *et al.* 2013) and, in Sweden, the launch of the first web-based gender-sensitive course for medical students by the Center of Gender Medicine of the Karolinska Institut (Miller *et al.*, 2016).

These international initiatives suggest that gender mainstreaming in medical education entails a structural review of skills, content, teaching, and learning outcomes (Verdonk *et al.*, 2008; Miller *et al.*, 2016). By summarising the works of Miller (*et al.*, 2016) and Verdonk (*et al.*, 2008), Ruiz-Cantero (*et al.*, 2019) came up with the following recommendations: (a) develop and use, as educational content, three to five clinical case studies in which the gender perspective is relevant; (b) promote student participation; (c) review documents and scientific literature; (d) include gender in 10% of exam questions; and (e) work within the curriculum development committee. In addition, a cooperative climate must be created, the participation of the organisation's stakeholders must be stimulated, human resources must be trained, and change agents must be identified (Verdonk *et al.*, 2008; Miller *et al.*, 2016; Ruiz-Cantero *et al.*, 2019).

The involvement of stakeholders and agents to facilitate change and overcome resistance (Kalpazidou Schmidt, Cacace, 2019) takes us back to the need to frame gender mainstreaming recommendations into a broader structural approach based on a double strategy which draws its theoretical premises from the feminist standpoint theory, according to which the quest for gendering education parallels the quest for

gender equality among educators themselves, namely, academics and university managers.

For Italy, in addition to the approval of the 03/2018 law on gender medicine and the creation, in 2019, of a national observatory (Ministero della Salute, 2019), a few promising practices have been implemented concerning medical education, such as the proposal signed in 2016 by the deans of medical schools to include in every subject course a focus on sex and gender differences in health⁴ (Bellini *et al.*, 2017). The proposal intends to provide medical students with a gender approach, revising the core curriculum of the degree programme in medicine and surgery. Two key actions are suggested to make this proposal operational. The first asks for the integration of the gender approach in the educational objectives and outcomes of degree programmes, while the second proposes the inclusion of optional courses and seminars on gender medicine in the educational offer (Bellini *et al.*, 2017).

The 2016 agreement follows the implementation of a few fragmented experiences undertaken by single universities. In 2012, three pilot courses on sex and gender in medicine were launched at the University of Milan within the framework of the European FP7 Project STAGES (Structural Transformation to Achieve Gender Equality in Research and Science) (Del Giorgio *et al.*, 2016). In 2013, the first subject course in gender medicine was offered at the University of Padua, and between 2014 and 2016, thematic gender courses began to be offered at the University of Siena and the University of Ferrara (Éupolis, 2016; Signani *et al.*, 2018). In 2018, the University of Ferrara set up the first Gender Medicine Centre funded by the Ministry of Education, University and Research (MIUR) under the supervision of the Italian National Institute of Health. The centre has launched a digital platform providing gender biomedical content to support faculty members in the integration of a gender perspective into their courses (Signani *et al.*, 2018).

These initiatives came with political and economic support from the organisations in which they emerged. However, they remain fragmented practices strongly dependent on the actors involved. If implemented, the 03/2018 law would represent an important step in the direction of developing a systematic sex and gendered approach in medical education and training at a national level. Unfortunately, the law does not foresee the allocation of specific funds to implement its principles and objectives. Moreover, three years after its approval by the Parliament, the training plan outlined in the law is still lacking. As a consequence, no guidelines or mandatory recommendations in the fields of education, teaching and training exist. However, such guidelines would be essential to enable change.

Conclusions

Gender biases in medicine threaten the accuracy and generalisation of scientific results as well as the quality of care, given that *male-standard patient*-based therapies fail to take into account women's specific needs, sometimes with harmful consequences. In addition to gender blindness (that is, the omission of gender differences in health and illness), stereotyping based on gender norms and expectations occurs at the expense not only of women, but also of men.

⁴ The Implementation Plan of the Law 03/2018, published on 21 June 2019, includes four areas of intervention, among which training and education for a specific implementation plan were originally foreseen (Ministero della Salute, 2019).

Gender biases are reproduced at different levels: research, the clinic, and teaching. Each level includes different forms of bias and involves different actors (researchers, practitioners, and professors) working in different organisations (research organisations, healthcare providers, and medical schools). The three levels are, of course, strongly interconnected, which is why interventions aimed at gendering the medical sciences should be multileveled while targeting different types of institutions.

However, while the inclusion of gender in research activities has been systematically approached at the institutional level, through European research funding schemes, less attention has been drawn to the sectors of education and training. In this respect, experiences of change have been quite fragmented and limited to single countries and/or organisations. However, educational change is an essential pillar to take care of given that it is at medical schools and in universities that future researchers and physicians are currently educated and trained. From this perspective, recent initiatives aimed at debiasing (medical) teaching in academic institutions should be enhanced and promoted more systematically by following the double-edged approach adopted by the EC in its research policies; that is, by paralleling strategies to mainstream gender in higher education curricula with structural changes meant to reinforce gender equality in Academia.

In Italy, the 03/2018 law on gender medicine represents a good legal framework tackling all three levels of bias reproduction, including teaching. However, the implementation plan concerning education and training is still lacking. In addition, it would help to boost innovation in the provision of content and materials in higher education and medical schools. A step toward its realisation should be urgently undertaken.

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