

# Gender inequalities in medical careers: evidences from five hospitals in the Lombardy Region

Camilla Gaiaschi

Department of Social and Political Sciences, University of Milan. Received 7 June 2018; accepted 7 September 2018.

**Summary.** Women have made a significant progress in the medical profession, but despite this trend gender inequalities in pay and career advancement persist. This study investigates the determinants of wage and promotion differentials among physicians based on a dataset of more than 1000 doctors working in five hospitals in the Lombardy Region, Italy. Data were collected through an online survey with a response rate of 48.7%. Controlling for differences in observed characteristics, women earn 18% less than their male colleagues while they are less likely to be promoted from the early to the mid-level of the career ladder, while no adjusted penalty in promotion persists from the mid-level to the final step of the ladder. This result suggests that female underrepresentation in senior positions is due more to a sticky floor mechanism than to a glass ceiling effect.

**Key words:** gender inequalities, women physicians, medical careers, gender pay gap, gender promotion gap.

## *Le disuguaglianze di genere nelle carriere mediche: evidenze da 5 ospedali della Regione Lombardia*

**Riassunto.** Le donne hanno fatto progressi significativi nella professione medica, ma nonostante questa tendenza persistono disparità di genere nella retribuzione e nell'avanzamento di carriera. Questo studio indaga i determinanti dei salari e dei differenziali di promozione tra i medici sulla base di un dataset di oltre 1000 medici che lavorano in cinque ospedali nella Regione Lombardia, Italia. I dati sono stati raccolti attraverso un sondaggio online con un tasso di risposta del 48,7%. Controllando le differenze nelle caratteristiche osservate, le donne guadagnano il 18% in meno rispetto ai loro colleghi maschi e hanno meno probabilità di essere promosse. Lo svantaggio di genere nella promozione sussiste al passaggio tra il primo e il secondo livello, ma non nel passaggio dal secondo al terzo livello. Questo risultato suggerisce che la sottorappresentazione femminile nelle posizioni apicali è dovuta più a un meccanismo di 'sticky floors' (pavimenti che incollano) che a un effetto di 'glass ceiling' (soffitti di vetro).

**Parole chiave:** disuguaglianze di genere, donne e medicina, carriere mediche, disuguaglianze di genere nelle retribuzioni, disuguaglianze di genere nelle promozioni.

## Introduction

Women have made a significant progress in the medical profession. In 2014, they accounted for 41.2% of all physicians in OECD countries, a 21% increase in ten years. Italy fits the OECD average with 40.3% of women physicians, up from 33% in 2004\*. The proportion of women doctors is unlikely to stop growing, given that most of the physicians close to retirement are male and most medical school graduates are women\*\*. Despite this trend towards gender parity in the composition of the profession, inequalities between men and women physicians in pay and career progression persist.

Most of the literature on gender inequalities among physicians find that pay differentials persist notwithstanding equal characteristics<sup>1-9</sup>. Women tend to cluster in less remunerative organizations and specialties<sup>3,5,7, 10-14</sup>, while they are more likely to be under-represented in senior and leadership positions<sup>2,5,15-21</sup> because they are less likely to be promoted across the career ladder<sup>15,16,22,23</sup>.

The great majority of these studies have taken place in the United States. To my knowledge, the present study is the first one to focus on the situation in Italy by analysing wage and promotion differentials between men and women doctors in five health organizations.

## The research field

The analysis of this research study is based on a dataset collected through an online questionnaire sent to physicians working in five hospitals in the Lombardy Region, in Italy. Data collection lasted from two to three months for each hospital and required more than one year overall to be completed, starting in June 2014 and ending in July 2015. The questionnaire aimed to collect informa-

\* OECD. Health Care Resources. Physicians by age and gender, 2014. Data extracted on 29 April 2017 from the following link: [stats.oecd.org](http://stats.oecd.org)

\*\* See also: OECD. Education at a glance. Share of women graduates by field, 2013 for the OECD average and 2014 for Italy. Data extracted on 29 April 2017 from the following link: [stats.oecd.org](http://stats.oecd.org)

tion on the demographic, human capital, work and family characteristics of physicians. Together with the dataset collected through the survey, each hospital provided a dataset containing the general information on its medical population (gender, rank, type of practice, specialty, etc.) so that the representativeness of the respondents could be tested\*. Of the 2205 physicians who received the questionnaire, 1074 answered (response rate of 48.7%). The five hospitals were chosen to be as representative as possible of the healthcare system in the Lombardy Region because they vary in sector (three are public, two are private), vocation (three out of five are university hospitals), geography (two hospitals are located in Milan, two in the province of Milan, and one in the province of Como), and size (the physician numbers range from approximately 300 to approximately 900). The health system in the Lombardy Region is recognized as providing a wide range of services with high-quality standards within the strongly de-centralized National Health System. On the one hand, it promotes a mixed system because one-third of healthcare providers are private. On the other hand, it guarantees the principle of universal coverage and solidarity because patients can access private hospitals at the same cost as public providers (services are reimbursed by the Region). This has led to the creation of a highly competitive health care system. Focusing on this specific context allows reducing the heterogeneity in earnings and ranks provided that individuals are quite similar in terms of human capital investments and work characteristics. This limits the potential bias in the estimations due to unobserved characteristics.

### Research design and models

This paper investigates the differences between men and women in terms of pay and promotion in the medical profession. The analysis was carried out by means of linear (for the pay gap) and logistic (for the promotion gap) regressions on a cross-sectional dataset of nearly a thousand respondents.

With respect to the analysis of the pay gap, a multivariate OLS model based on the linear function of the logged income was run (Table 2). Two specifications are reported: the first specification indicates the unadjusted pay gap, that is female disadvantage on pay without controlling for gender differences in observable characteristics. The second specification reports the adjusted pay gap, that is the gap controlling for differences in

observable characteristics. Controls include educational credentials (which are operationalized through the final grade obtained in medical school), human capital attributes (number of months of international on-the-job training, years of work experience, weekly hours of work), institutional/organizational work features (hospital where the respondent works, rank, specialty), family characteristics (marital and parental status) and, lastly, work-life balance arrangements (weekly hours of care and domestic work and weekly hours of outsourced care and domestic work).

With respect to the analysis of the promotion gap, a multivariate logistic model was run following Baxter and Wright's methodology<sup>24</sup> with the aim of comparing the female odds of promotion at adjacent levels of the career ladder. Given a three-steps – 1<sup>st</sup> level, vice and head (“primario”) – career ladder, if the female odds of becoming head with respect to vice is worse than the female odds of becoming vice with respect to the 1<sup>st</sup> level (net of unobservable characteristics), this should be considered as evidence of the glass ceiling. On the contrary, if the female odds of becoming vice (with respect to 1<sup>st</sup>) is worse than the female odds of becoming head (with respect to head), then it means that obstacles to women's career advancement should be ascribed to a sticky floor mechanism. In order to take account of the cumulative effects of disadvantages<sup>25</sup>, the adjacent-levels logistic regressions will be paralleled by a non-adjacent-levels model measuring the odds of becoming head with respect to the 1<sup>st</sup> level. If adjacent-levels models analyze the variation of the gender gap through all the consecutive steps of the ladder, the non-adjacent regression captures the cumulative effect of early career obstacles on the final position of the ladder. For each model, both the unadjusted and the adjusted specifications are reported\*\*.

### Results

Table 1 reports the mean characteristics by gender. Women, on average, are younger than men and earn about € 23,000 less than their male colleagues\*\*\*. If women tend to graduate with slightly better grades, men tend to report more postgraduate on-the-job international training. Moreover, they tend to work slightly more than

\*\* Controls for the adjusted promotion gap are the same as those of the pay gap except, obviously, for the rank, which in this case is the dependent variable.

\*\*\* The respondents were asked to state their income, not their salary, to include earnings from private practice and any possible consultancy (medical) activities. Moreover, because these earnings from extra work are taxed once a year through the income tax return, the respondents were asked to report the gross value, which is easier to remember than the net value.

\* No significant differences were found between respondents and non-respondents based on the information provided by each hospital on its physicians, so the possibility of a selection bias in the answers could be excluded.

**Table 1.** Mean differences by characteristics.

	Men	Women	T-test
Annual income (euro)	85,973.03	62,747.42	0.0000
Age	52.29	47.89	0.0000
Grade	107.12	108.01	0.0004
Honors	45.11	51.46	0.0468
Work experience (years)	21.62	17.06	0.0000
Months of training abroad	5.20	2.80	0.0004
Work hours (h/w)	47.78	44.97	0.0000
Work hours w/o private practice (h/w)	44.03	42.93	0.0467
Private practice (h/w)	3.74	2.04	0.0000
Public hospital	81.56	84.07	0.2759
<i>Specialties</i>			
Medicine	39.78	56.05	0.0000
Surgery	35.08	15.93	0.0000
Diagnostic	21.16	23.8	0.2759
Public health	3.07	2.50	0.5765
All others	0.72	0.96	0.6649
<i>Rank</i>			
1st level	50.63	70.25	0.0000
Vice	28.57	18.62	0.0001
Head	18.81	6.14	0.0000
All others	1.99	4.99	0.007
Spouse or cohabiting partner	86.44	73.7	0.0000
Cohabiting partner	15.91	15.74	0.9378
Spouse	70.52	57.97	0.0000
Number of children	1.51	1.06	0.0000
Number of children living at home	1.11	0.96	0.0186
No children	23.87	38.96	0.0000
Unpaid work (h/w)	15.53	25.48	0.0000
Outsourced unpaid work (h/w)	5.75	6.95	0.0000

women: almost 48 hours a week versus 45 hours on average but this difference decreases to about one hour if the time spent on private practice is not considered.

The analysis of the gender composition of the specialties shows that 56% of women works in the medical field versus 40% of males, while only 16% of female doctors versus 35% of male doctors work in the surgical field. Together with the persistence of the horizontal segregation, the data confirm the existence of a vertical segregation mechanism. The different steps of the career ladder were harmonized by considering the differences between public and private hospitals and between the two private institutions. The result was a career lad-

der consisting of three steps: 1<sup>st</sup> level, vice and head ("primario")\*. The "all others" item in Table 1 com-

\* Public hospitals follow a national union contract while private hospitals have their own union contract which, moreover, is different between the two private hospitals surveyed. Public contracts include six steps, while the two private hospitals envisage five and three steps, respectively. The only common step to the five hospitals was the last one: the head of the unit ("primario"). As a consequence, the six-steps ladder of the three public hospitals and the five-steps ladder of one of the two private hospitals had to be merged into the three-steps ladder of the remaining private organization. This was done by analyzing the mean age, experience and income par step and by hospital.

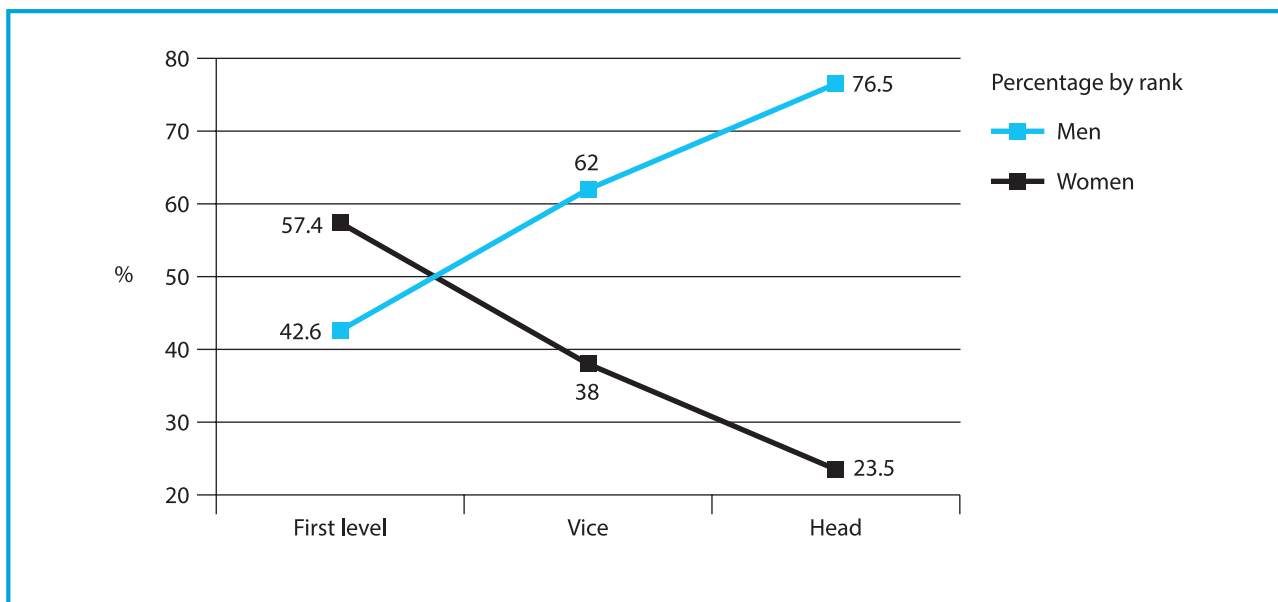


Figure 1. The scissor diagram.

prises thirty-seven cases that are difficult to place on an ordinal scale, which include collaborators, grant holders and freelancers working in public hospitals, as well as purely academic researchers. If Table 1 shows the distribution of the different steps of the ladder by gender, Figure 1 on the contrary shows the distribution of men and women by steps (“all others” step is omitted in this case). In both cases, data suggest that women are more likely to be concentrated in the early steps of the career ladder while most of the head physicians are men.

Men and women exhibit significant differences with respect to family characteristics as well. Women are less likely to be married than men (58% versus 70.5%) and they are more likely to have no children (39% vs 24%). Moreover, if they become parent, the number of children is lower than that of their male colleagues (1 vs 1.5)\*. Lastly, they spend more hours a week in domes-

\* This is not surprising considering both the specific population under analysis (which is characterized by highly skilled professionals) and the general Italian context (which is characterised by low levels of birth rates and a high female selection in full-time employment). It is well known that non-random female selection in employment partly explains the variation of the gender pay gap across countries (Olivetti and Petrongolo, 2008): while women who are employed tend to have relatively high-wage characteristics (i.e., higher education), low female employment is consistent with low gender gaps, as it is the case of Italy. One could assume that the same variation across countries could occur within the medical profession as well. Provided that part-time work among Italian physicians is extremely rare, one could expect lower gender gaps here than elsewhere. This hypothesis should be further investigated by means of a future comparative analysis.

Table 2. The gender pay gap.

	Female disadvantage	
	Unadjusted	Adjusted
b	-0.321***	-0.163***
(%)	37.8	17.7
R2	0.139	0.475
No.	908	908

p-values in parentheses.  
\*p <0.05, \*\*p <0.01, \*\*\*p <0.001.

tic and care work with respect to their male colleagues (25 vs 16 hours). These data suggest the division of unpaid work between men and women remains still unbalanced. As a consequence, women tend to overcome their work-life balance needs by not having children or by having, on average, only one child, as well as by outsourcing care and domestic work to care and cleaning staff.

Table 2 reports the OLS models on pay. The first column reports the unadjusted income gap, while the second column adds controls for differences in observable attributes. The results indicate that without controlling for characteristics, women earn 38% less than men (unadjusted pay gap) but once controls for differences in characteristics are added, the earning penalty eases to 18% (adjusted pay gap). This means that out of a 38% unadjusted gap, 49% is due to differences in observed characteristics (explained component of the gap), while

51% is due to direct discrimination against women and/or the effect of possible unobserved characteristics (unexplained component of the gap)\*.

Table 3 reports the logit models on rank. Three different regressions for each level of comparison are shown: the vice level against the 1<sup>st</sup> level (M1), the head level against the vice level (M2) and the head level against the first level (M3). For each model, both the adjusted and the unadjusted coefficients are reported. Considering the two adjacent-level models (M1 and M2), there is a significant unadjusted gender gap in promotion both at the vice (M1) and at the head (M2) levels. Adding controls for observed characteristics, women’s adjusted disadvantage in promotion from the vice to the head level (M2) falls short\*\*. On the contrary, the penalty from the first to the vice level (M1) persists notwithstanding equal attributes (-41%). These results suggest that female underrepresentation at the senior level is not due to a glass ceiling mechanism preventing women at the mid-step of the ladder to become head but, rather, it is due to a sticky floors process preventing women who in the early phases of their career to advance to the mid-step of the ladder. Because of the cumulative effect of disadvantages, sticky floors have negative effects later in the career: the non-adjacent level model (M3) shows that, given equal attributes, women in the first level are 57% less likely than their male colleagues to become head.

### Conclusions

Most studies on gender inequalities in pay and promotions among physicians have been conducted in the United States. This research study aims to fill the gap in the literature by focusing on the Italian context. The anal-

\* The explained component of the gap should not be considered as its “legitimate” part as neoliberal and conservative scholarship tends to do when it ascribes it to men’s and women’s different “choices” (Mincer and Polacheck, 1974; Becker, 1991) or “preferences” (Hakim, 2000). As feminist and structuralist scholars have shown, choices and preferences are often shaped by material and cultural constraints (Grimshaw and Rubery, 2002; Olsen and Walby, 2004; Crompton et al., 2005; Haveman and Baresford, 2012). This means that the part of the gap “explained” by differences in observable (human capital, work and family) characteristics may be (partly) affected by discrimination through a mechanism of “feedback effects” (Oaxaca, 1973; Grimshaw and Rubery, 2002). As a consequence, it is incorrect to consider the explained component of the gender gap as its “legitimate” component.

\*\* By progressively adding controls (analysis not shown, available upon request), the analysis shows that this is due to differences in work experience. This means that women’s mean younger age significantly contributes to their disadvantage in promotion from the vice to the head level.

**Table 3.** The gender promotion gap.

		Female disadvantage		
		Unadjusted	Adjusted	
M1	Vice vs 1st level	b	-0.855***	-0.529**
		e^b	0.43	0.59
		e^b (%)	-57.5	-41.1
		Pseudo R2	0,03	0,19
		No.	846	846
M2	Head vs vice	b	-0.659**	-0.422
		e^b	0.52	0.66
		e^b (%)	-48.3	-34.5
		Pseudo R2	0.016	0.25
		No.	342	342
M3	Head vs 1st level	b	-1.514***	-0.846*
		e^b	0.22	0.43
		e^b (%)	-78	-57.1
		Pseudo R2	0.077	0.527
		No.	754	754

\*p <0.05, \*\*p <0.01, \*\*\*p <0.001.

ysis conducted on nearly a thousand physicians in five hospitals of the Lombardy Region shows that women physicians earn 18% less than men controlling for differences in characteristics. This penalty should be ascribed to gender discrimination and/or to unobserved characteristics. Together with the persistence of a gender pay gap, women face obstacles in career progression as they are 41% less likely to advance from the first to the vice level, while no adjusted promotion gap persists from the vice to the head level. This means that the vertical segregation among physicians is due more to a sticky floor mechanism than to a glass ceiling effect. Because of the cumulative effects of disadvantages, the penalty that women experience from the early to the mid-steps of the ladder explains their underrepresentation in the upper rank. In summary, women earn less than men and they are less likely to be promoted from the first to the vice level given equal attributes. These results call into play the role of discrimination to explain gender inequalities in pay and promotion among physicians.



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*Correspondence to:*

**Camilla Gaiaschi**  
Department of Social and Political Sciences  
GENDERS Research Centre  
University of Milan  
Via Conservatorio 7  
20122 Milan, Italy  
email camilla.gaiaschi@unimi.it