LSE Teaching and Learning Centre

The following paper was written during LSE GROUPS 2019.

LSE GROUPS takes place during the final fortnight of the summer term. Undergraduate students are placed in small groups; these are cross-year, interdisciplinary, and group members do not know one another in advance. Each group must then devise its own research question, and carry out all stages of a small-scale research project in less than two weeks.

The overall theme of LSE GROUPS 2019 was *The Future of Work.*

This paper was submitted on the final Thursday afternoon of the project. (Students then presented their work at a conference, on the closing Friday.)

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Relationship between the share of women GPs and patient satisfaction: a case for gender equality* in the future healthcare workplace

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*Gender equality and gender balance are used interchangeably in this paper; they all imply adequate female representation (where the 'adequate' level equals the level in the counterfactual world where gender per se does not influence representation).

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Abstract

It has been widely noted that the health sector is a large area of growth in the labour market and is predicted to grow even more[1]. In the meantime, as the workplace in other sectors is becoming more gender-equal, the health sector seems to lag behind. These two considerations motivate us to investigate the relationship between gender balance in the health sector in England and quality of care, which has not yet been widely studied. In our research, we use patient satisfaction as a proxy for quality of care. We adopt a fixed-effects regression model to examine the correlation between the share of women GP and patient satisfaction rates, in 7915 NHS England GP practices, from 2013 to 2017. Controlling for practical and patient characteristics, we find a positive correlation between both variables of interest. The relationship can be fitted to an inverted U-shaped curve, with the optimal share of women GP being between 0.51 and 0.57 (depending on measure of satisfaction). We conclude with the suggestion that gender balance improves health outcomes in terms of patient satisfaction, and with the hope that our research gives more evidence for the importance of gender equality in the future workplace.

Keywords: gender equality, GP practices, NHS England, patient satisfaction, future workplace

1 Introduction

We study whether there is a positive relationship between gender balance and patient satisfaction levels in 7915 NHS England GP practices, for 5 consecutive years (2013-17), using a fixed-effects regression model.

1.1 Motivations

There is a body of literature about the relationship between gender balance and workplace performance, but not much in the health care sector (in which case workplace performance should be represented as patient satisfaction, mortality rates for operations, living quality improvements, etc.); given that health care is crucial to everyone, and that health care is likely to grow into an even larger sector

[1] See, e.g., Pissarides, 2018; LSE Growth Commission, (2017)

in the future labour market (especially given aging population), research in the area is needed.

A large amount of similar studies has been carried out in the business sector. Dezso & Ross (2012) find that female representation in top management brings beneficial informational and social diversity to the top management team, enriches the behaviour exhibited by managers throughout the firm, and motivates women in middle management; this implies improved managerial task performance and therefore firm performance. Zhang (2017) finds that the conjunction of gender balance and normative acceptance of gender diversity in a country or industry implies higher firm valuation in the market and higher firm revenue. Such research on the substantive representation of women[2] and their important findings, and the lack of literature on studies of the same nature in health care in the UK, and the importance of health care for all citizens and in the future labour market, inspire us to write this paper on gender ratio and patient satisfaction.

1.2 Choice of subject of investigation

There has already been some literature in the US on topics of this nature, but not so much in the UK. Given the importance of research in this area to welfare, equality, and the future workplace, we hope to provoke further research by carrying out initial investigation.

Furthermore, the NHS has gender inequality. There was a hourly gender pay gap of 22% in NHS England[3]. Also, higher ranks see fewer women: only 35% of consultants are women[4]. (We chose to study GPs rather than consultants only because we lack data on consultants.)

[2]Substantive representation refers to the substantive effects of having more women in the sector in question on representation of women.

[3]NHS England Gender Pay Report, 2018

[4]General Medical Council, 2019,
https://data.gmc-uk.org/gmcdata/home//reports/The%20Register/Stats/report

We also had the practical consideration that NHS data is accessible enough to allow us to produce this research in a short amount of time, without waiting for data retrieval.

1.3 Methodology

We adopt a fixed-effects regression model to examine the correlation between the share of women GP and patient satisfaction rates, in 7915 NHS England GP practices, from 2013 to 2017.

1.4 Key findings

Controlling for a whole set of factors, we find a positive correlation between the share of women GP in a practice and patient satisfaction for the same practice. We see three obvious relationships:

(i) A 1% increase in the share of women GP in a practice is associated with a 1.6% increase in the share of respondents who had a good overall experience with their GP, ceteris paribus.

(ii) A 1% increase in the share of women GP in a practice is associated with a 3.3% increase in the share of respondents who believe their GP treated them with care and concern, ceteris paribus.

(iii) A 1% increase in the share of women GP in a practice is associated with a 3.3% increase in the share of respondents who believe their GP sufficiently involved them in decisions about their healthcare, ceteris paribus.

1.5 Implications

Our aim is purely to give more evidence for gender equality and more specifically women representation, in the sector of health care, from the point of view of aggregate welfare. We intentionally refrain from giving complete policy suggestions in this paper. Normative judgments on public policy deserve papers on their own, should be left to moral and political philosophers, and are beyond the scope of our paper.

Indeed, we note that aggregate welfare may not be the sole consideration when formulating public policy; other criteria such as realising social/distributive justice[5], promoting ethos[6], the will of the people, may be important as well (if not more). We shall not assign weights to each value where they conflict; that is what political philosophers do when constructing a theory of justice[7].

On this particular topic, many already subscribe to equality of opportunity between genders, and equality can be an intrinsic good; we wish to challenge the zero-sum view that more equality may give lower aggregate utility, by giving a further argument that more women representation is instrumentally good for all.

2 Literature Review

We review the literature of gender effects on physicians' performance. Many recent studies have focused on the topic of gender performance in the health care sector. The studies first focused on the disparities between the proceedings of male and female physicians, to eventually shift to the results. Overall it has been

[5]For a discussion of the primacy of justice, see Rawls's (1999) seminal work; cf. Sandel (1998) for his seminal communitarian critique. For what social justice conceptually entails, see Rawls (1999); cf. Nozick (1974), Cohen (2009); for an excellent critical overview, see Barry (1989).

[6]What theory best constructs an institution conducive to a sense of ethos and love is discussed in the philosophy literature. See Rawls (1999), Kymlicka (2002); cf. Sandel (1998).

[7]A theory of justice, as Rawls (1999) notes, prescribes 'the appropriate distribution of the benefits and burdens of social cooperation'.

observed that women engage differently with patients and tend to have slightly better results than men.

2.1 Female physicians are more patient-oriented

Bertakis and Helms (1995) demonstrate that female physicians engage in more preventive assistance and communicate more adequately with their patients; they also achieve a higher satisfaction score.

These findings are supported by another study (Krupat & Rosenkranz, 2000), which concludes that female physicians are more patient-centred and that patient-centredness correlates with patient satisfaction.

Further, meta-analysis (Roter, Hall & Aoki, 2002) confirms the two previous studies and added that female primary care physicians engage in more communication than their fellow male colleagues. Additionally, the visits with their patients are longer. Roter et al. calculated that on average, the visits are two minutes longer with female physicians, without regard to the content or the quality of the time spent.

2.2 Female physicians follow clinical guidelines more closely

Women tend to adhere to the recommended doses of medicine more than men. Baumhakel, Muller & Bohm (2009). show that when treating heart failure, male physicians tend to administer loser doses to female patients than suggested by clinical guidelines. This also shows that male physicians take more risks. Tsugawa, Jena, Figueroa et al. (2017) found similar results studying elderly hospitalised patients.

2.3 How our study is situated in the literature

The aforementioned studies show that women GPs follow clinical guidelines more closely and are more patient-oriented; this can lead to lower mortality and readmission rates.

These findings, mostly in the US, inspire us to conduct studies on NHS England. Our study will try to find similar results using data from the NHS. Our research will focus on women in general without diving into individual performances. We assume that individual performance and group performance are highly correlated.

However, one could argue that the best solution would be to have 100% of female physicians. This is not what the studies and our study are concluding; other external factors give a peak performance at exact gender equality in the share of employees.

3 Sample and Methodology

This study tests the hypothesis that an increase in the share of women GP is associated with an increase in patient satisfaction, ceteris paribus, by analysing data drawn from the NHS England database.

3.1 GP Patient Survey[8] (GPPS)

The GPPS is an independent survey run by Ipsos MORI and developed in collaboration with the University of Cambridge and the Medical department of the University of Exeter, on behalf of NHS England. The survey is sent out to over two million people across England every year with an average response rate of 38% over its nine years of existence.

[8] http://www.gp-patient.co.uk/surveysandreports

"Patients were eligible for inclusion in the survey if they had a valid NHS number, had been registered with a GP practice continuously for at least six months before being selected, and were 18 years of age or over. A number of checks were made on the supplied names and addresses to remove inappropriate records. The sample size was determined for each practice to deliver a likely confidence interval of 9.0 percentage points (two-tailed, at the 95% level) in the majority of practices on a question where it was assumed that 50% of the respondents will respond one way and 50% will respond another." The surveyors thus adopted random sampling for each practice to ensure perfect population representation.[9] Table X displays this balance (compared to ONS statistics).

Respondents were asked 63 questions about their GP practice, including questions about their last appointment, their health conditions, and their personal characteristics. From these questions, we have selected eight which we believe to reliably measure a GP's 'quality' of care:

Table 1: Dependent Variables

Label	Survey Question
gpcare	Rating of GP treating you with care and concern (% answered "Good")
gpinvolve	Rating of GP involving you in decisions about your care (% answered "Good")
gptime	Rating of GP giving you enough time (% answered "Good")
gplisten	Rating of GP listening to you (% answered "Good")
gpexpl	Rating of GP explaining tests and treatments (% answered "Good")
gptrust	Confidence and trust in GP (% answered "Yes")
gpoverall	Overall experience of GP surgery (% answered "Good")
gprecrate	Recommending GP surgery to someone who has just moved to the local area (% answered "Yes")

We also use the self-prescribed patient characteristics as control variables to

[9] GP Patient Survey – Technical Annex, 2018 (found at above link)

get a more precise estimate of the correlation between the share of women GP in each practice, and patient satisfaction (see Appendix for more details).

3.2 General Practice Workforce Series[10] (GPWS)

The general practice data shows numbers and details of GPs, Nurses, Direct Patient Care and Admin/Non-Clinical staff working in General Practices in England, along with information on their practices, staff, patients, and the services they provide. It is collected yearly and holds information (on average) on 7915 practices in England. This dataset gives us our independent variable:

shrwgp	Share of women GP in a practice

It also gives us more control variables. Overall, we get the following control variables, which gives us a representative sample based on ONS statistics, using 31 735 observations.

[10] https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services

Table 2: Control Variables

Label	Description	Mean	Min	Max
ccgid	CCG id (Clinical Commissioning Groups are clinically-led statutory NHS bodies responsible for the planning and commissioning of healthcare services for their local area)	-	-	-
regid	NHS England Commissioning Region Code	-	-	-
totpat	Total headcount of patients for each practice	7440	0	61083
shrwpat	Share of women patients for each practice	0.495	0	0.85
shrwhite	Share of respondents who answer 'any "white" background'	0.838	0	1
implongwait	Share of respondents who answer 'I have to wait far too long'	0.091	0	0.675
smoker	Share of respondents who smoke regularly and/or occasionally	0.175	0	0.942
parent	Share of respondents who are parents	0.264	0	0.755
unemp	Share of respondents who are unemployed	0.057	0	0.654
age55	Share of respondents who are older than 55	0.375	0	1
hc	Share of respondents who have a long-term health condition	0.537	0.189	0.987

3.3 Our regression model: Fixed effects panel data

Using these two datasets, we have been able to create panel data with 31,735 observations. To study this data, we have chosen a fixed effects model. There is strong evidence to reject the null hypothesis that the variation across practices is random and uncorrelated with our independent variables. Fixed-effects models control for all time-invariant and entity-invariant differences between and across GP practices so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics. This is effective as it controls for a lot of idiosyncrasies, especially for the ones that we do not or cannot observe.

We use the following model:

$$Y_{it} = \alpha_{it} + \beta_1 shrwgp_{it} + \beta_2 shrwgp2_{it} + \gamma_i + \delta_t + controls_{it} + \epsilon_{it} \qquad (1)$$

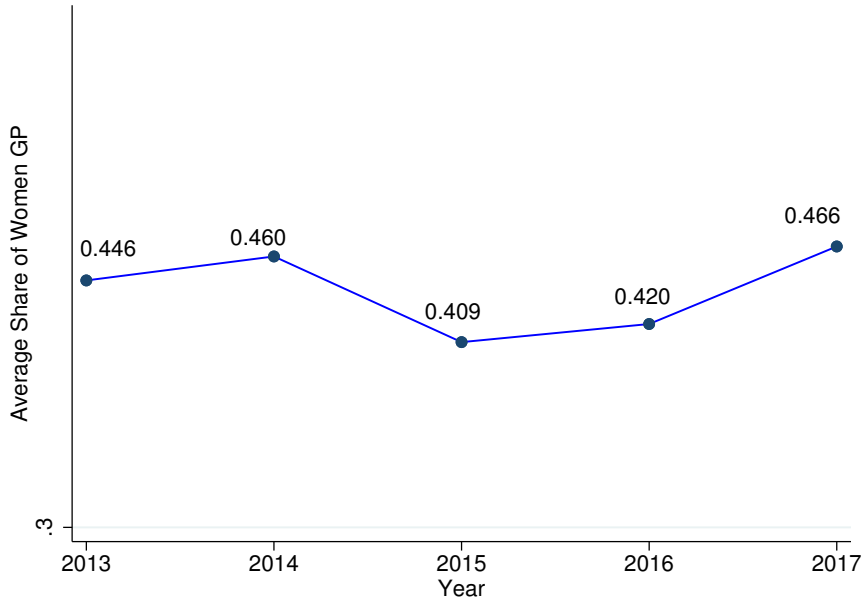
where:

i	= practice (i = 1 to 7915)
t	= year (t = 1 to 5 with 1 representing 2013)
Y_{it}	= dependent variable, i.e. our survey questions
α_{it}	= intercept for each practice in each year
$shrwgp_{it}$	= independent variable, i.e. share of women GP for each practice in each year
$shrwgp_{it}^2$	= independent variable squared
β_i	= coefficient, i.e. ceteris paribus relationship between Y_{it} *and* $shrwgp_{it}$
γ_i	= practice level fixed effect term, i.e. characteristics invariant across practices
δ_t	= year fixed effect term, i.e. characteristics that are invariant across years
$controls_{it}$	= represents our controls (see Table X)
ϵ_{it}	= error term

4 Results and Discussion

In this section, we examine our data.

Figure 1: Average share of women GPs across 5 years (2013-2017)



The average share of women in NHS England GP practices has decreased from 2014 to 2015 but has steadily increased from 2015 to 2017 (Fig. 1). The table, which depicts the average share of women GP, suggests that this optimum interval has not been reached yet even though improvement has been made in the past five years. Indeed the share of female GPs used to be 44.6% in 2013 and despite the decrease to 40.9% in 2015, the overall trend is a slight increase to eventually reach 46.6% in 2017.

Table 3 displays the output we obtained by running the regression model (eq.1). We have chosen to focus our discussion only on *gpcare*, *gpinvolve*, and *gpoverall*. Our rationale is that *gpoverall* will give us the overall relationship between the share of women GP in a practice and the overall satisfaction rate of the same prac-

tice, and *gpinvolve* and *gpcare* are representative enough of the patient-oriented characteristic of women GPs, based on what previous papers had found.

Our empirical findings suggest a positive correlation between the share of women GP in a practice and patient satisfaction for the same practice. For these three outcomes, we see the following, here evaluated at x=0.5:

(i) A 1% increase in the share of women GP in a practice is associated with a 1.6% increase in the share of respondents who had a good overall experience with their GP, ceteris paribus.

(ii) A 1% increase in the share of women GP in a practice is associated with a 3.3% increase in the share of respondents who believe their GP treated them with care and concern, ceteris paribus.

(iii) A 1% increase in the share of women GP in a practice is associated with a 3.3% increase in the share of respondents who believe their GP sufficiently involved them in decisions about their healthcare, ceteris paribus.

These results are statistically significant at the 1% level for *gpcare* and *gpinvolve* and at the 5% level for *gpoverall*.

The first conclusion is clear: the share of women GP in a practice mostly correlates with how well a GP involves a patient in decision making, and how much care a GP gives a patient. This is coherent with the literature; at an individual GP level, female GPs are more patient-oriented than their male counterparts, engaging in more preventive assistance and communicating more adequately with their patients (Bertakis et al., 1995; Roter et al., 2002).

Table 3: Regression table

	(1) gpcare	(2) gpinvolve	(3) gpoverall
shrwgp	0.033***	0.033***	0.016**
	(0.006)	(0.007)	(0.006)
shrwgp2	-0.029***	-0.029***	-0.015*
	(0.007)	(0.007)	(0.006)
totpat	-0.000*	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
ccgid	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
regid	-0.022	-0.034	-0.024
	(0.016)	(0.019)	(0.023)
hc	0.031***	0.044***	0.013*
	(0.006)	(0.007)	(0.006)
shrwpat	0.005	0.057	0.133***
	(0.036)	(0.040)	(0.038)
shrwhite	0.010	-0.004	0.022*
	(0.010)	(0.010)	(0.009)
implongwait	-0.264***	-0.275***	-0.466***
	(0.009)	(0.010)	(0.010)
smoker	-0.015*	0.005	0.015*
	(0.007)	(0.008)	(0.007)
parent	0.048***	0.052***	0.036***
	(0.007)	(0.007)	(0.006)
unemp	0.036**	0.044***	0.068***
	(0.011)	(0.012)	(0.011)
age55	0.089***	0.074***	0.066***
	(0.008)	(0.009)	(0.008)
_cons	0.824***	0.763***	0.837***
	(0.043)	(0.050)	(0.056)
N	31735	31735	31735

Notes: Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table with remaining dependent variables in appendix

However, as the relationship between *shrwgp* and out outcomes seems to follow an inverted-U shape, we must also consider how the relationship changes as the share of women GP increases. Figures 1, 2 & 3 graph this relationship (no controls included) and plot our second conclusion: there is an 'optimal' gender ratio given by the maximum of the quadratic function. Values 0.565, 0.569 and 0.557 were found to be the optimal ratios when using *gpcare*, *gpinvolve* and *gpoverall* respectively (All are statistically significant at the 1% level). This confirms the literature's suggestion that the best solution is not to go towards either extreme levels of gender balance and that gender-balanced workplaces lead to more commitment from employees (Olafsdottir and Einarsdottir, 2016).

To explain the relationship, one of our hypotheses, inspired by Zhang's (2017)[11] study, is that the conjunction of gender balance and normative acceptance of gender diversity in an organisation implies better performance. Zhang argues that stakeholders 'value normatively accepted practices' and 'penalize practices that fall outside the normative expectation' (Westphal and Zajac 1998; Zajac and Westphal 2004; Zuckerman 1999). In our context, the UK does have social awareness and acceptance of gender equality, and so deviations from that means stakeholders become less satisfied.

Another explanation could be familiarity with the same group of people (van Knippenberg & Schippers, 2007). In our case, we posit that around half of the entire population is female, whose needs may be (perceived to be) better understood. Hence the optimal value of around 50%.

Figure 1 suggests that this optimum interval has not been reached yet even though improvement has been made over the past two years.

[11] Zhang's study discusses organisational performance, with a main focus on corporate performance; Zhang's explanation, however, can still be invoked here, as the psychological effects should be the same.

Figure 2: Share of Women GPs vs. Rating of GP treating you with care and concern

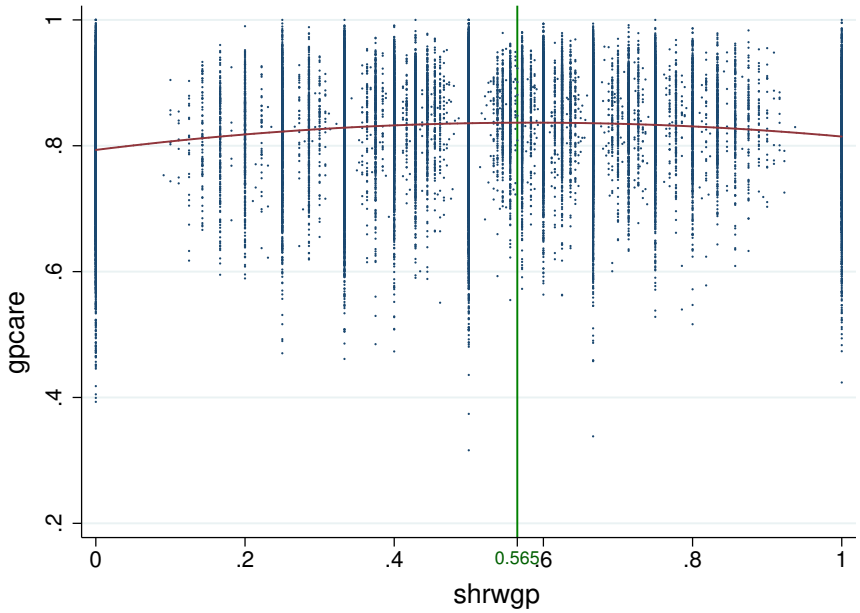


Figure 3: Share of Women GPs vs. Rating of GP involving you in decisions about your care

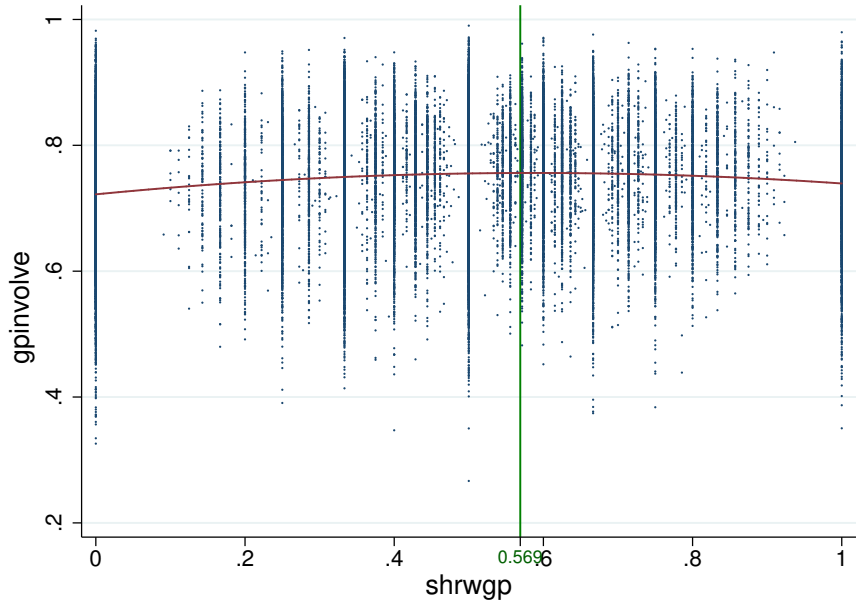
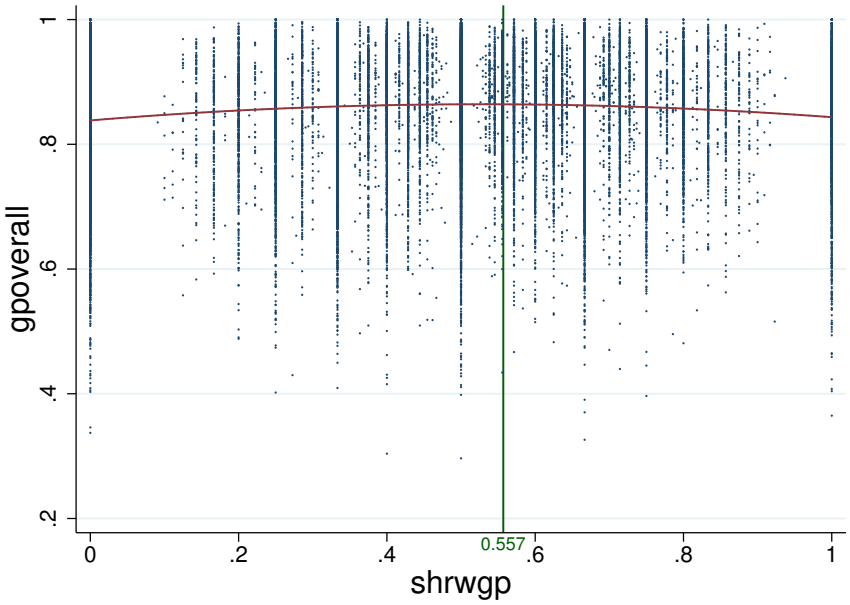


Figure 4: Share of Women GPs vs. Overall experience of GP surgery



However, there are limitations to our findings. The first issue is that our model explains only 10.1% of total variation (average R-squared is 0.107), meaning that we have not been able to explain or control for everything. The coefficient on *gpoverall* confirms this intuition as the share of women GP is less correlated with the overall experience, compared to more precise survey questions. Part of this limitation comes from the use of survey data, as patient responses on GP 'quality' might be biased due to uncorrelated factors such as weather or the impression of waiting a long time in a waiting room [12]. We have tried to control for as many of these uncorrelated variables as possible, but it is very likely we have omitted some.

Furthermore, surveys are subjective interpretations of the 'quality' of care of a GP. A patient cannot or does not know how to measure [13], and the GP patient

[12] look up the reliability of surveys by James Dean Brown

[13] It is very difficult for patients to feel or understand the small variations in the amount of medicine injected (Baumhäkel, Müller, and Böhm, 2009)

survey does not ask more precise questions such as "How cautious is your GP?" or "Did your GP follow medical standards accurately?". This means that the survey results might not provide an accurate measure of 'quality'.

It follows from this last point that a different approach to this question might yield different results, and might make the argument for gender balance more convincing. A first basic improvement would be to study this question at the individual level, something we were not able to do as the GPPS does not mention the gender of the GP being evaluated. A more granulated panel data would most likely give more precise estimates. A second improvement would be to use a more comprehensive approach such as the RAND methodology (2001), taking into account survey questions, healthcare outcomes in headcounts and expert opinion.

5 Conclusion

We have found a positive correlation between gender balance and patient satisfaction, using a fixed-effect regression model. The relationship can be fitted to an inverted U-shaped curve, with the optimal share of women GP being between 0.51 and 0.57 (depending on the measure of satisfaction). We conclude with the suggestion that gender balance improves patient satisfaction, and with the hope that our research gives more evidence for the importance of gender equality in the future workplace.

We also suggest that all doctors - male or female or others - be further trained to adhere more closely to clinical guidelines, and also in expressing empathy/care for patients (which are currently lacking in clinical training), given what we now know about the positive impact.

As we acknowledge the limitations of our model and the data we obtained, we also hope that this research can provoke interest in further studies, which could further the cause of gender equality in the workplace and beyond.

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Appendix

Table 4: Regression table

	(1) gptime	(2) gpexpl	(3) gprecrate	(4) gplisten	(5) gptrust
shrwgp	0.026***	0.027***	0.027***	0.026***	0.014**
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)
shrwgp2	-0.026***	-0.025***	-0.025**	-0.023***	-0.014**
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)
totpat	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ccgid	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
regid	-0.026	-0.031	-0.013	-0.027	-0.019
	(0.017)	(0.017)	(0.016)	(0.017)	(0.014)
hc	0.026***	0.031***	0.012	0.014*	0.011*
	(0.006)	(0.006)	(0.007)	(0.006)	(0.005)
shrwpat	0.087**	0.074*	0.210***	0.046	0.032
	(0.030)	(0.034)	(0.054)	(0.029)	(0.022)
shrwhite	0.012	-0.002	0.037***	0.007	0.003
	(0.009)	(0.010)	(0.011)	(0.009)	(0.007)
implongwait	-0.243***	-0.241***	-0.535***	-0.224***	-0.162***
	(0.009)	(0.009)	(0.012)	(0.008)	(0.007)
smoker	0.011	0.017*	0.026**	-0.004	-0.004
	(0.007)	(0.007)	(0.009)	(0.007)	(0.005)
parent	0.048***	0.054***	0.034***	0.048***	0.027***
	(0.006)	(0.007)	(0.008)	(0.006)	(0.005)
unemp	0.045***	0.055***	0.062***	0.025*	0.019*
	(0.010)	(0.011)	(0.013)	(0.010)	(0.008)
age55	0.061***	0.084***	0.044***	0.066***	0.053***
	(0.008)	(0.008)	(0.010)	(0.007)	(0.006)
_cons	0.842***	0.819***	0.701***	0.883***	0.935***
	(0.043)	(0.044)	(0.046)	(0.043)	(0.034)
N	31735	31734	31735	31735	31735

Notes: Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$