Reform Impacts: The Long-Term Outcomes of an Equal Opportunity Admissions Reform

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Abstract

We study the long-term effects of a Pakistani reform that exogenously increased the share of female doctors by collecting original data on 650 medical doctors. Using a difference-in-differences strategy, we show that 20 years on, female doctors who were new entrants in male-dominated specialties are more likely to consult for free, work in public hospitals and spend less time per patient relative to their counterparts in a female-dominated specialty, and to male doctors in their own specialty. They also receive fewer serious disciplinary actions. Differences between male and female doctors are plausibly explained by female doctors of the same cohort remaining in junior roles. Overall, the reform exacerbated labor market segmention between male and female doctors.

Keywords: Development; economics of gender.

JEL Classifications: O10; J16

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1 Introduction

A number of once male-dominated jobs now comprise a female majority, including post-secondary teachers, advertising sales agents, and artists (247 Wall Street, 2021). Perhaps nowhere is this change as dramatic as in medicine: an industry worth $9.8 trillion dollars and 10 percent of GDP globally (World Economic Forum, 2024). Only 6 percent of US medical students were female in 1960, and 55 percent were female by 2020 (AAMC, 2023; Heiser, Stuart, 2017), with similar trends in a few other countries (Penny et al., 2014). This has created speculations about the future of medical practice (AAMC, 2018). But it is difficult to determine if women alter an occupation by entering it, or if they enter when it has already changed and become welcoming to them. We fill this research gap by using a plausibly exogenous shock to the medical labor force to examine how medical practice changes in the long run after an increase in its female share of medical doctors.

Our empirical strategy uses a novel natural experiment: In 1992, Pakistani courts struck a 20 percent cap on women's seats in medical schools and replaced it with merit-based admissions. The female share in medicine increased by 10 percentage points immediately (Aqeel, 2024). Our analysis proceeds in the following steps: first, we compare specialties where the female share increased ("treated fields") to plausible control specialties that were not affected. This allows us to examine how mixed-gender specialties changed relative to homogenous fields. Second, we examine labor market segmentation by comparing female and male doctors *within* treated specialties. Our control groups in the first part of the analysis rely on a unique cultural feature of this setting: almost all medical specialties were treated by the reform, with two notable exceptions ("controls"): gynecology and urology. For cultural and religious reasons[1], gynecology is consistently almost completely female and urology is male[2]. We use these

[1]For example, the website "Islam QA" provides the following information: *"If a woman has a wound in a part of the body that is impermissible for a male to look at (meaning other than the face, hands & feet), it will be impermissible for her to receive treatment from a male doctor, rather a female should be instructed to treat her...". The rule is relaxed if no female doctor of similar qualifications as a male doctor is available.*

[2]Medical doctor registration data from the Pakistan Medical and Dental Council show that 95 percent of

two medical specialties as separate control groups in our analysis. Our results are robust to an alternate specification which uses medical specialty-level gender ratios directly, but notably, these ratios are determined endogenously. The data we use is from a survey of medical practice among 653 randomly selected Pakistani doctors that we conducted in 2022 and 2023[3]. We supplement our data with official medical doctor registration data, including on the disciplinary cases faced by doctors. To the best of our knowledge, our combination of data provide greater detail on medical practice in Pakistan than any other available source.

We begin by comparing fields where the female share increased to the female-only field of gynecology. Average consulting fee, pay or output are not substantially different in treated fields relative to the control. This is unlike recent findings which show female entry to reduce the average pay in a field (Harris, 2022; Oldenziel, 2001; Li, 2024). We find, however, that the reform lowered the pay of *female* doctors, especially in fields where their share increased but they remained a minority. Post-reform female doctors are 44 percent more likely to consult with patients for free compared to the control group and pre-reform doctors even when controlling for ability. In terms of output, they spend 24 percent *less* time per patient and have fewer consulting hours at their primary practice relative to the control, while male doctors do not. These changes are consistent with, though not fully explained by, where doctors work. Pre-reform female doctors in treated fields mostly work in niche private hospitals[4] and provide 20 percent more expensive consultations compared to the same cohorts of the control. In contrast, as their numbers in treated specialties have grown, post-reform female doctors are 61 percentage points more likely

gynecologists are female, 99 percent of urologists are male, and gender ratios did not substantially change in these specialties after the reform: the female share in gynecology increased by 5 percent and in urology by 4.3 percent after the reform.

[3]We randomly sampled doctors from the registration data, and provided them to Gallup Pakistan for data collection. Gynecologists and urologists (in the second round) were oversampled to serve as control groups.

[4]In our data, only 27 percent of female doctors in treated fields who graduated before the reform work currently in public hospitals, while 39 percent of post-reform female doctors do. Overall, 44 percent of doctors in treated fields work in the public sector.

to work in public hospitals in 2022, and 20 percentage points more likely to have *started* their careers at public hospitals as well. Together, these results show that female doctors in treated fields had greater accessibility after the reform, but also lower pay. While there is no survey data on the gender of doctor consulted by patients, fee expenses for patients at public hospitals decreased over this time, and free consultations by female doctors may be one reason for this change.

Next, we examine segmentation by comparing female and male doctors within treated fields. Twenty years on, post-reform female doctors are 24 percentage points more likely to consult for free compared to their male counterparts. This difference disappears when controlling for seniority, which suggests that post-reform female doctors did not rise to the same level as men in their medical cohort. Women were more likely to have displaced male doctors in small, public hospitals. Differences in output are not statistically significant between men and women. However, about 75 percent of reported disciplinary cases are faced by male doctors, even as the female share of doctors increased from 29 to 55 percent after the reform. Post-reform male doctors in treated fields became 54 percent more likely to recieve harsh penalties compared to female doctors of the same age and seniority, potentially because they perform lower risk medical procedures. Overall, our results suggest that the labor market became more segmented as the share of female doctors increased.

Our findings have implications for research in labor economics on pay inequality, and policy literature on healthcare quality. While the gender pay gap has narrowed in several fields (Blau and Kahn, 2020; McFall et al., 2024), recent work shows that the overall pay in occupations decreases as women become more prevalent (Harris, 2022; Oldenziel, 2001; Li, 2024). This can occur through a variety of mechanisms, such as a decrease in prestige (Goldin, 2014), or a shift toward higher non-pecuniary amenities or payments (Lee and Thompson, 2019). Our results are different from both these findings. Instead, we show that twenty years on, female doctors affected by the reform charge less for consultations

than their counterparts. Our results are consistent with an increase in specialized labor supply that decreases wages for female specialists, and the existence and widening of segmented labor markets between men and women (Pelley and Carnes, 2020). One reason that the segmentation exists is because women remain in lower paying roles even within the same occupation or job function (Bolotnyy and Emanuel, 2022; Adams-Prassl et al., 2023), which is what we find to be the case as well. To our knowledge, this is the first paper that documents long-run labor market patterns after the plausibly exogenous entry of women in a field.

Second, our paper contributes to policy literature on healthcare quality (Das et al., 2008; Das and Hammer, 2005). A large question in this literature is how medical reforms affect the quality of care (Alexander, 2020; Das et al., 2016). We show that the admissions reform increased the ability of medical doctors, especially of male doctors. Doctor ability is positively related to patient outcomes. In our data, the highest scoring doctors spend more time with each patient, all else equal. The reform also increased the accessibility of female doctors in terms of practice place and consultation fee. These could potentially reduce the health cost burden experienced by patients. On the other hand, female doctors spent relatively less time per patient than their counterparts, which is a margin along which the quality of care decreased (Ganguli et al., 2020). Among othe reasons, this could be due to tight work and life balance time constraints faced by female doctors (Majid, 2020; Majid and Siegmann, 2021).

The remaining paper is structured as follows. In section 2 we describe the policy change in medical schools, and the structure of healthcare in Pakistan. Section 3 lays out our data collection, and our identification strategy. Section 4 discusses our main findings, followed by robustness checks in section 5. Finally, we present our conclusions in section 6.

2 Background

Health Care in Pakistan and Medical Schools: As of 2022, health care in Pakistan represented approximately 1.2 percent of GDP annually (International Trade Administration, 2022). The government spent 38 USD per capita on health care in 2023, which was lower than in other developing countries such as India, Ghana and the Phillipines (Khan et al., 2023). There has traditionally been a shortage of health resources for the population: in 2022, 68 percent of all births were attended by skilled staff, 85 percent of children between 12 to 23 months old were immunized against diphtheria, tetanus, and pertussis (DPT), and the overall physician to population ratio at 1.1:1000 in 2019 was lower than that recommended by the WHO in 2024 (2.5:1000)(World Bank, 2024). Until about 2020, 88 percent of health costs are paid out-of-pocket by patients in Pakistan (Naz and Sriram, 2024), which increases the risk that households fall into a health poverty trap. Recent efforts to improve the health system include a universal healthcare program introduced in 2019 (Khan et al., 2023). Partly as a result of these, between 2010 and 2020 out-of-pocket expenditures as a percentage of current health expenditure decreased from 67 to 55 percent, but remain substantial.

In the current system, healthcare is provided by both the public and private sectors. Though the private health care sector is small, it caters to a large proportion of the urban population. In 2016, 35 percent of all physicians worked in the private sector and were consulted by 75 percent of the urban population at least once (World Health Organization, 2016). Similarly, of the 1,982 hospitals in 2022, 700 (35 percent) were private and 1,282 (65 percent) were public hospitals (International Trade Administration, 2022). The cost of care at private hospitals is usually higher, and the salary that doctors earn at private hospitals can be upto three times that of public hospital[5]. The fee charged of patients at public hospitals is minimal, usually ranging from zero to 500 PKR ($0 to $1.80). By comparison, the fee at private hospitals can be as high as 2000 to 5000 PKR ($15-$30).

[5] https://www.hippocraticadventures.com/practicing-medicine-in-pakistan/

For context, an individual who earns $10 to $40 a day is considered middle class in Pakistan[6] The number of doctors in Pakistan has grown steadily from 48 in 1947 when it was founded to about 274,000 in 2022[7]. Applications to medical school take place directly after completing the appropriate pre-medical courses in high school. According to the PMDC, medical school admissions are determined by an entrance exam score (which accounts for 50 percent of the overall candidate score), high school grades (40 percent of the overall score) and middle school grades (10 percent of the overall score). Before the year 2000, a candidate's score was determined by high school and middle school grades alone (Andrabi and Singh, 2015). After five years of medical school, medical graduates register to practice with their basic M.B.B.S degree[8], or pursue a residency (locally also known as a "house-job") and fellowship in a chosen medical specialty.

The Policy Change: The quota for women in medical school was started in 1948 to reserve 20 percent of medical college seats in public and private colleges for women, and 80 percent for men. Over time, more women applied to medical college, and the number of female applicants outgrew the number of reserved female seats (Masood, 2019). In the early 1980s, concerns about the quality of medical education led to a reduction in the total number of medical seats. Within the women's quota, the entry threshold of scores increased and became 8 percent higher for women than for men (Andrabi and Singh, 2015).

The quota was removed after a 1989 court case when a group of female applicants to medical school, led by Shrin Munir, alleged that they were denied admission despite scoring higher than several men. A court ruling decided that the old admissions policy was unconstitutional, stating that "the selection procedures violated [sections of] the Pakistani Constitution prohibiting discrimination [...] on the basis of sex" (Shrin Munir

[6] https://profit.pakistantoday.com.pk/2022/12/04/income-culture-and-inequality-who-are-pa

[7] Pakistan Ministry of Health and Planning Commission, and Pakistan Medical Council.

[8] M.B.B.S stands for Bachelor of Medicine, Bachelor of Surgery. It is equivalent to being a Doctor of Medicine.

and others v. Government of Punjab through Secretary Health, Lahore and another (PLD 1990 SC 295)[9]. A few months later, a similar case was won in the province of Sindh[10]. Subsequently, the admissions policy was changed in 1991 to being based purely on merit. Women and men had an equal opportunity of being admitted to medical school for all cohorts starting in 1992. The first cohort affected by the reform is expected to have graduated in 1997 and begin their residency.

3 Data and Empirical Framework

3.1 Data

We collected two rounds of surveys data on doctors across Pakistan for a total of 658 doctors. The surveys were carried out by Gallup Pakistan from May to September of 2022 and May and September of 2023. In the first round, we collected data on 420 doctors and oversampled gynecologists to have a main comparison group for our analysis. In the second round, we collected data on 268 additional doctors and oversampled urologists in addition to gynecolofists based on early feedback on the need for a male dominated field as a control group for men. We also included questions about doctor test score ability and background such as birth place and parental eduction in the second round.

For each survey round, we started with a list of doctor names and information from doctor registration data available on the website of the Pakistan Medical and Dental Association. We randomly sampled doctors from this list while oversampling control group doctors, and gave Gallup ten times as many doctor names as our target survey sample size. The Gallup team first found contact information on these doctors and approached them via email and social media. If there was no response, the doctors were contacted by phone or in person. Eighty percent of the surveys were completed in person,

[9] Available through: https://pakistanconstitutionlaw.com/pld-1990-sc-295/

[10] https://pakistanconstitutionlaw.com/p-l-d-1990-karachi-342/

13 percent on the phone, and the remaining through other means such as email or social media. The survey team reported a response rate in both rounds of about 86 percent conditional on the doctor being located and contacted.

In table 1 we present summary statistics on the overall sample. The average doctor in our sample is 43 years old, 76 percent have an urban place of birth and 93 percent currently practices in an urban place. Forty-five percent of the sample are female, only a third are married, almost all currently practice, and fifty percent of these practice in the public sector. About 27 percent also have a secondary private practice, and the average doctor in our sample spends more hours a week in practice than in research or teaching[11].

In table 2, we present differences between doctors by treatment and control groups for doctors who graduated before the reform[12]. Consistent with cultural norms, only 29 percent of non-gynecologists are female in the survey, while 100 percent of gynecologists are female. Non-gynecologists also less urban, score almost 5 percentage points lower on test scores, and have more doctor family members and are less likely to be married than gynecologists. In terms of medical practice, the non-gynecologists who graduated before the reform are less likely to have an urban or a public practice, spend less time in out-patient consulting hours although they spend more time practicing, consult with fewer patients and spend less time per patient than gynecologists. Treatment and control doctors are balanced on the fee charged per patient and monthly salary.

Since the reform changed the gender composition of the doctor labor force, we also examine how female doctors differ from male doctors among those who graduated before the reform. Many differences mirror those between gynecologists and non-gynecologists, underlining the pre-existing gender composition of the treatment and control groups. For exampl, male doctors are from a less urban background, lower scoring and have more doctors in the family (table 3). In terms of medical practice, male doctors are 9 percentage points more likely to have an urban practice, spend less time consulting with patients

[11]Total time per patient and hours spent on practice are categorical variables.
[12]The first class affected by the reform (in the year 1997).

but more time at their practice overall, and spend less time per patient. Male and female doctors who graduated before the reform are equally likely to have a second practice, but female doctors are more likely to consult with patients in the afternoon. Differently from in the comparison between gynecologists and non-gynecologists, male doctors have a higher base salary than female doctors.

Finally, the reform changed admissions to be more competitive, so that average test scores should be higher for doctors affected by the reform than those who were not. In table B.1, doctors who graduated after the reform score higher on their secondary school and middle school exit exams, but are not different in most other ways. These averages are reassuring in that the main difference between cohorts who graduated before and after the reform are in their test score ability, and not in other background characteristics.

3.2 Comparing our survey to the PMDC doctor registration data

Doctor registration data, publicly available from the Pakistan Medical and Dental Council (PMDC) website, contains a complete count of doctors who registered to practice anywhere in Pakistan. Doctors are legally bound to register to practice in Pakistan (PMDC)[13].

The PMDC data provide the name of the university that doctors received their Bachelors in Medicine, and their university of specialization, where applicable. Unfortunately, if students receive their degree from a medical college, only the university that the college is affiliated with is listed. In the PMDC data, 92 percent of doctors between 1952 and 2018 received their Bachelors in Medicine (MBBS) from a public university (the share is similar for female doctors at 91 percent)[14]. Completing an MBBS from a public university is associated with an 11 percentage point increase in the likelihood

[13]The data contain information on the district of current practice, the university where the doctor received their bachelors, and if applicable, their specialization degree, what they specialized in, their gender, name and father's name.

[14]The share increased to 94 percent for the time period between 1987 and 2007 (92 percent for female doctors).

of specializing from a public hospital. Ninety-seven percent of all doctors and female doctors specialized from a public hospital between 1952-2018.

Whle the PMDC does not provide information on the place of current practice, in 2016, 65 percent of Pakistani doctors practiced in the public sector, and in the registration data X percent of doctors are female. Therefore, our sample has a greater share of female (45 percent) and private practice doctors (65 percent). We address the latter of these two discrepancies in section 5. Also, 95 percent of gynecologists are female in PMDC, whereas 100 percent are female in our data.

We classify the 10 largest cities in Pakistan as "urban" in the PMDC data. This is a more conservative definition than in the Census of Pakistan, which designates smaller cities an urban status as well. On average, 72 percent of MBBS doctors and 80 percent of specialists between 1952 and 2018 practiced in urban areas at the time of their most recent registration[15]. Specialists are more likely to work in urban areas, where most larger hospitals with technical facilities exist. In our data, 84 percent of MBBS doctors and 94 percent of specialists practice in urban areas, which is slightly more urban than in the registration data, but qualitatively similar.

While the PMDC registration data provide information on several important features of a census of doctors, they do not provide information on other career aspects, such as where doctors completed their residency, on their current work practices. Our survey fills this the gap by measuring details on doctor practices, and is the only national level survey to our knowledge that collects this information.

3.3 Identification

The medical school reform drastically altered the composition of medical students, and subsequently doctors. Aqeel (2024) show that the reform increased the female share of

[15]Between 1987 and 2007, the share increases to 79 percent for MBBS doctors and specialists, which indicates a greater urbanization of medical doctors and especially of MBBS doctors.

	Mean	SD	Min	Max	N
Age	43.43	11.51	23.00	74.00	654
Urban Birthplace	0.76	0.43	0.00	1.00	250
Secondary School Score (%)	88.22	5.96	64.00	98.00	242
Middle School Score (%)	86.83	5.10	65.00	98.00	220
Mother's Education	12.04	2.85	1.00	15.00	250
Father's Education	13.01	2.02	1.00	16.00	250
No. Other Doctors	1.66	2.09	0.00	15.00	250
Marriage Age	27.63	2.13	20.00	35.00	228
Married	0.34	0.48	0.00	1.00	659
Age at First Child	29.83	2.40	23.00	38.00	225
Currently Practice	0.96	0.19	0.00	1.00	653
Urban Practice	0.93	0.26	0.00	1.00	627
Public Practice	0.50	0.50	0.00	1.00	627
Have a Second Practice	0.27	0.45	0.00	1.00	626
Hours Consulting Patients (daily)	4.91	2.46	0.00	19.00	659
Log(Fee)	4.96	2.85	0.00	7.60	621
Log(Fee 2)	6.74	0.88	0.00	8.29	171
Salary	3.77	1.66	1.00	8.00	244
Total Time per Patient	3.07	1.84	0.00	10.00	659
Total Time per Patient 1	2.34	1.13	0.00	6.00	659
Time per Patient 2	0.73	1.34	0.00	5.00	659
Total Number Patients (daily)	35.47	27.27	0.00	135.00	659
Total Number Patients 1 (daily)	30.61	23.59	0.00	100.00	659
Number Patients 2 (daily)	4.86	9.56	0.00	46.00	659
Practice Hours (wk)	2.59	1.01	1.00	6.00	625
Teaching Hours (wk)	0.61	0.86	0.00	5.00	654
Research Hours (wk)	0.80	0.87	0.00	5.00	654
Morning Hours	0.79	0.41	0.00	1.00	634
Afternoon Hours	0.59	0.49	0.00	1.00	634
Evening Hours	0.36	0.48	0.00	1.00	634
Overnight Hours	0.02	0.14	0.00	1.00	634

Note: The table presents summary statistics for the full sample of Pakistani doctors. Data are collected by the authors in 2022 and 2023.

Table 1: Summary Statistics: Full Sample

	Mean (Treated)	Mean (Control)	Difference	SE	N
	.				
Age	57.21	54.80	-2.42***	0.78	229
Urban Birthplace	0.61	0.86	0.25***	0.08	116
Secondary School Score (%)	85.56	90.45	4.90***	1.02	114
Middle School Score (%)	83.86	87.34	3.48***	0.91	103
Mother's Education	12.36	11.86	-0.50	0.42	116
Father's Education	13.21	12.89	-0.32	0.33	116
No. Other Doctors	2.46	0.77	-1.69***	0.33	116
Marriage Age	28.15	27.05	-1.11***	0.42	116
Married	0.42	0.75	0.33***	0.07	230
Age at First Child	30.26	29.39	-0.88*	0.48	116
Currently Practice	0.93	1.00	0.07***	0.02	227
Urban Practice	0.88	1.00	0.12***	0.03	215
Public Practice	0.44	0.58	0.14*	0.08	215
Have a Second Practice	0.22	0.27	0.05	0.07	215
Hours Consulting Patients (daily)	4.53	5.59	1.06***	0.40	230
Log(Fee)	5.13	5.42	0.30	0.41	212
Log(Fee 2)	6.31	7.22	0.91***	0.28	50
Salary	4.42	4.14	-0.28	0.31	113
Total Time per Patient	2.57	3.02	0.44*	0.23	230
Total Time per Patient 1	2.07	2.36	0.29**	0.14	230
Time per Patient 2	0.50	0.66	0.16	0.18	230
Total Number Patients (daily)	30.52	42.36	11.84***	4.03	230
Total Number Patients 1 (daily)	26.32	36.10	9.79***	3.08	230
Number Patients 2 (daily)	4.20	6.25	2.05	1.66	230
Practice Hours (wk)	2.72	2.41	-0.32**	0.13	215
Teaching Hours (wk)	0.61	0.81	0.20	0.13	229
Research Hours (wk)	0.64	1.41	0.77***	0.14	229
Morning Hours	0.79	0.75	-0.04	0.07	218
Afternoon Hours	0.51	0.68	0.17**	0.07	218
Evening Hours	0.28	0.39	0.11	0.07	218
Overnight Hours	0.03	0.03	0.01	0.03	218

Note: The table presents differences in means between pre-reform treated and control group doctors. Pre-reform refers to those who graduated before the reform. Treated refers to non-gynecologists and control to gynecologists. Data are collected by the authors in 2022 and 2023.

Table 2: Treated and Control Doctors: Pre-Reform Graduates

	Mean (Male)	Mean (Female)	Difference	SE	N
	.				
Age	57.58	54.59	2.99***	0.77	229
Urban Birthplace	0.59	0.88	-0.29***	0.08	116
Secondary School Score (%)	85.99	89.53	-3.55***	1.15	114
Middle School Score (%)	84.25	86.66	-2.41**	0.98	103
Mother's Education	12.41	11.83	0.58	0.43	116
Father's Education	13.26	12.83	0.43	0.33	116
No. Other Doctors	2.41	0.98	1.43***	0.35	116
Marriage Age	28.16	27.13	1.04**	0.41	116
Married	0.44	0.63	-0.19***	0.07	229
Age at First Child	30.35	29.33	1.02**	0.46	116
Currently Practice	0.93	0.99	-0.05**	0.02	226
Urban Practice	0.88	0.97	-0.09***	0.03	215
Public Practice	0.45	0.51	-0.06	0.07	215
Have a Second Practice	0.23	0.24	-0.02	0.06	215
Hours Consulting Patients (daily)	4.46	5.55	-1.09***	0.40	229
Log(Fee)	5.12	5.37	-0.24	0.38	212
Log(Fee 2)	6.25	7.23	-0.98***	0.28	50
Salary	4.53	4.00	0.53*	0.31	113
Total Time per Patient	2.52	3.05	-0.53**	0.22	229
Total Time per Patient 1	2.01	2.45	-0.44***	0.14	229
Time per Patient 2	0.52	0.61	-0.09	0.16	229
Total Number Patients (daily)	31.88	37.38	-5.51	3.69	229
Total Number Patients 1 (daily)	27.44	32.00	-4.56	2.92	229
Number Patients 2 (daily)	4.44	5.38	-0.94	1.47	229
Practice Hours (wk)	2.73	2.46	0.27**	0.13	215
Teaching Hours (wk)	0.59	0.82	-0.23*	0.13	229
Research Hours (wk)	0.65	1.22	-0.58***	0.13	229
Morning Hours	0.80	0.73	0.06	0.06	218
Afternoon Hours	0.50	0.67	-0.17**	0.07	218
Evening Hours	0.28	0.37	-0.09	0.07	218
Overnight Hours	0.01	0.05	-0.04	0.03	218

Note: The table presents differences in means between pre-reform male and female doctors. Pre-reform refers to those who graduated before the reform. Data are collected by the authors in 2022 and 2023.

Table 3: Male and Female Doctors: Pre-Reform Graduates

doctors and specialists in almost all specialty fields (see figure 1). An initial attempt to estimate the reform's effects would compare cohorts of medical graduates who are likely to have been affected by the reform or not, based on when they attended medical school. We estimate these effects using an event study type analysis with no control group:

$$Y_{ist} = \beta_0 + \sum_{-26}^{24} \beta_k D_t^k + \beta_3 SpecialtyGroup_s + \gamma X_{ist} + \beta_4 Post_t + u_{ist} \tag{1}$$

In equation 1, Y_{ist} represents the outcome for individual i in treated medical specialty s and graduation cohort t, the D_t^k are indicators for every two year graduation cohort[16], and the β_k capture how graduation cohorts within the same specialty are different. To reduce the number of specialty fixed effects estimated, we group specialties into 7 categories: Non-specialized, surgery, medicine, cardiology, urology, gynecology and all other specialties, which includes specialties with fewer than 20 observations. X_{ist} includes controls for individual age, age-squared, the α_r are survey round fixed effects, the α_t mare graduation year fixed effects, and u_{ist} is an individual-level disturbance term. Standard errors are clustered by grouped medical specialty. Results are provided in the Appendix.

However, since this estimation is also affected by trends over cohorts, we use a novel control group, gynecology, for our main analysis, and urology as a secondary control for our results on male doctors. We argue that gynecology is a plausible control group because the specialty has been almost completely female dominated for cultural reasons. The website Islam QA provides the following information[17]: *"If a woman has a wound in a part of the body that is impermissible for a male to look at (meaning other than the face, hands & feet), it will be impermissible for her to receive treatment from a male doctor, rather a female should*

[16] We group cohorts into intervals of two years to avoid small sample sizes for individual years, especially among the earlier cohorts.

[17] https://islamqa.org/

be instructed to treat her...[18]". Therefore, there was not much room for the female share of gynecologists to increase like they did in other medical specialties and among non-specialists. Similarly, urology, at the other end of the gender ratio spectrum, is culturally dominated by men.

The reform, therefore, changed gender ratios in most medical specialties, and among non-specialists, but gynecology remained an outlier. Figure 2 plots the change in share of female specialists in all specialties by their initial share of female specialists. The upward sloping line suggests that the growth in the share of females was positively correlated with how many females were in the field before the reform. This includes fields such as dermatology, which may be attractive to women. Gynecology is an extreme outlier with a high share of women ex-ante, and a low increase in female share ex-post. A simple regression reveals that a 1 percent increase in the pre-existing share of females is correlated with a 38 percentage point increase in the share of women after the reform, after controlling for specialty group and graduation year[19].

We estimate:

$$Y_{ist} = \beta_0 + \beta_1(Treated * Post)_{st} + \beta_2 SpecialtyGroup_s + \gamma X_{ist} + \alpha_r + \alpha_t + u_{ist} \tag{2}$$

where the outcome Y is defined for individual i in medical specialty group s and from graduation cohort t. The group "treated" includes all medical specialties (including non-specialists) except gynecology. There are over 40 specialties in the data. All other terms and standard errors are as before. The main coefficient of interest in 2 is β_1, which estimates the effect of the reform on doctors in treated (or, "mixed") specialties relative to gynecology. Results are provided in the Results section.

[18]The rule is relaxed if no female doctor of similar qualifications as a male doctor is available.

[19]This estimate is found by excluding the outlier gynecology. When gynecology is included, the coefficient falls to a 5 percentage point increase.

Our estimation relies on the assumption that trends in mixed fields would be the same as in gynecology if the reform did not occur, which we provide suggestive evidence of using event studies. We estimate event studies for our comparison between treated and control groups:

$$Y_{ist} = \beta_0 + \sum_{-26}^{24} \beta_k D_t^k * Treated_s + \beta_3 SpecialtyGroup_s + \gamma X_{ist} + \beta_4 Post_t + u_{ist} \tag{3}$$

The event study is similar in form to equation 1, but the β_k are estimates for treated cohorts relative to gynecologists for every two year graduation cohort. A second difference is that $Post_t$ groups all graduation cohorts after the reform to reduce the number of fixed effects estimated.

For the analysis of segmentation within treated fields, we estimate 2 and replace "Treated" with an indicator for being male.

We address remaining concerns here. First, gynecology and urology may be imperfect control groups, since they are specific fields that have their own unique trends. We oversampled doctors from each of these specialties to reduce the likelihood that random shocks or outliers affect our estimates. Additionally, we provide event study estimates with no control groups. These event studies plot the evolution of outcomes for male and female doctors in treated fields only. We also repeat our analysis in section 5 by using the share of female doctors in a specialty before the reform. Fields that had a higher share of female before the reform also recieved more females after the reform. Therefore, the pre-reform shares are endogenous to characteristics of fields that make them attractive to women. Further, the shares often have a very wide spread, with a small number of observations for any one share value. We use this as a robustness excercise, however, as further evidence that our results reflect primarily changes in gender ratios in a field.

Second, the graduation years of respondents range from 1971 to 2023, which is a span of almost 50 years. In order to reach our target sample size, we had to widen the range of graduation years we considered for the survey. However, this large period is bound to include other changes to the medical field, such as the growth of large private medical schools. To account for this, our main regressions estimate the effect of the reform using all respondents, and then focus on respondents who graduated 10 years before and after the first class that was treated (between 1987 and 2007). We include graduation year fixed effects in almost all our regressions. While this can be taxing for certain estimations given a smaller sample size, since some graduation years have very few observations, we believe that graduation year fixed effects can account for year-specific factors such as the number of private hospitals and the vacancies in private hospitals in a given year.

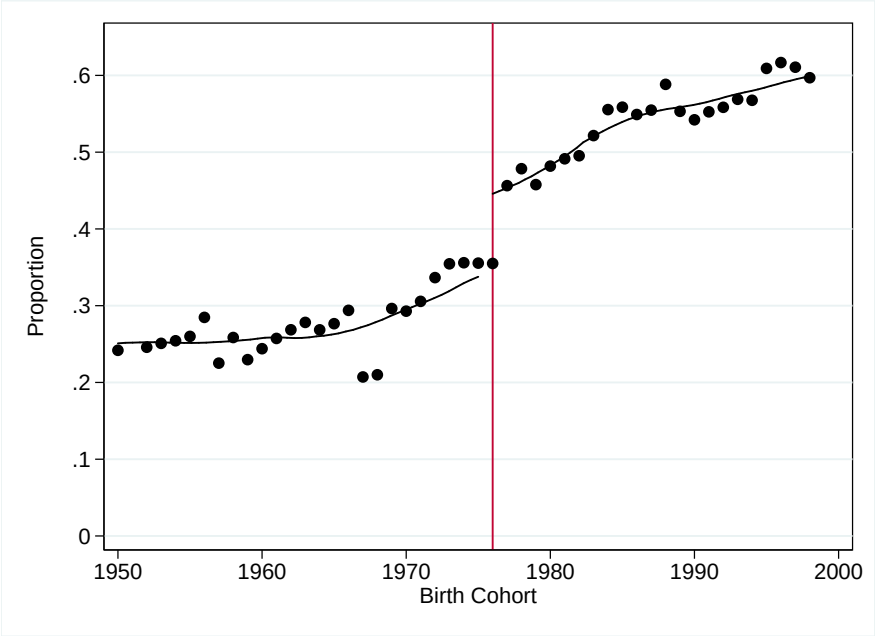
Third, our data collects information on current work practices of doctors. We collected some retrospective data, such as on test scores, where a medical residency was completed and where respondents attended medical school. However, retrospective data on variables such as the fee charged or time spent per patient at a respondent's first job was difficult to collect. Background characteristics, such as place of birth and high school test scores, will remain constant over time for respondents. However, traits such as medical practices, vary with time. To some degree, there is persistence over time in the type of hospital that doctors work in, which is correlated with the medical practices adopted by doctors. But for the most part, we can only speak to how doctors affected by the reform currently fare in medical practice relative to those who were not affected.

Fourth, our analysis could suffer from survivor bias. In other words, our survey captures the select group of individuals who remained in the labor force for a long period of time. While specialists, who are the greater focus of this paper, are less likely to drop out of the labor force early than non-specialists because of their level of investment in the medical profession, we show using doctor registration data that the rate of drop-off is similar for treated and control groups, which is reassuring to the extent that both groups

are similarly affected by individuals leaving the profession.

Fifth, the reform did not have a staggered implementation, and our identification is therefore not based on a staggered difference-in-differences design. The reform occurred in a single year in 1992, implying no differential treatment timing across medical fields. However, the reform could induce variation in treatment intensity. Gender ratios may increase to a greater extent in specialties which were more accessible to women in terms of work flexibility. Therefore, we can observe and measure the average treatment effect on the treated (ATT), which is identified using the standard parallel trends assumption. We do not make claims about average treatment effect (ATE), which is identified using a stricter parallel trends assumption[20](Callaway et al., 2021).

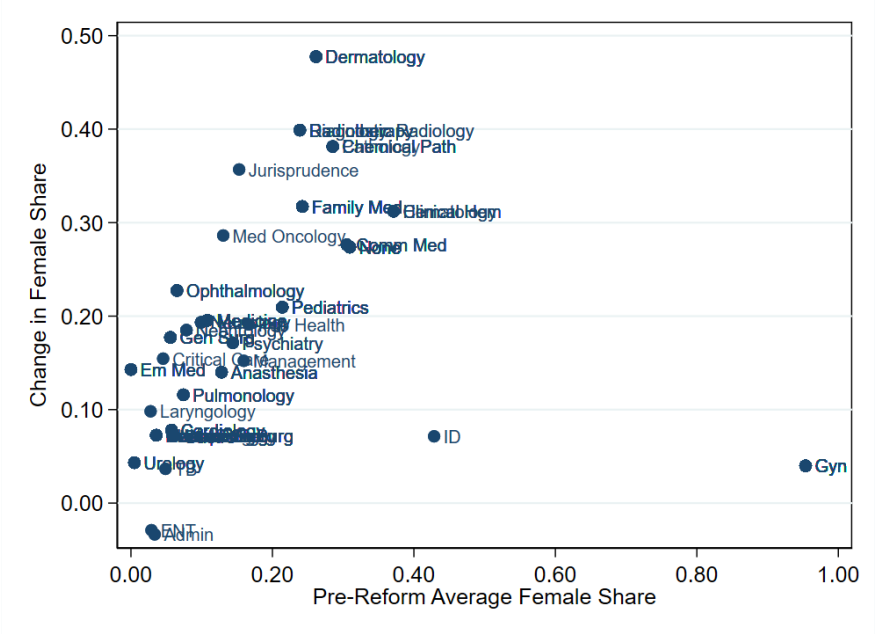
Figure 1: The Female Share of Medical Students



Note: The graphs are made using a census of doctor's registration data from the Pakistan Medical Council between 1952 and 2000. Points represent mean share for the birth cohort, lines are local polynomials of degree 0. Reproduced from (Aqeel, 2024).

[20]The assumption is that fields that receive a different dose would have the same outcome if they received any other dose (and not just no dose as in the control group).

Figure 2: Changes in the Female Share of Specialties



Note: The graph plots the relationship between the pre-reform average share of female specialists and the change in female share of specialists. Data are from the PMC Medical Doctor Database between 1952 and 2018.

4 Results

4.1 How did the reform change the selection of doctors?

The 1992 reform removed the quota on female medical students in favor of merit based admissions. The first evidence of test scores changing due to the change is in table B.1, where test scores improve by 4.19 points, or almost 5 percent from the average scores. In table 4, we present results of estimating equation 2 for changes in treated medical doctors' background characteristics relative to gynecology[21]. After the reform, the high school test scores of doctors increased by about 3 percentage points in non-gynecology relative

[21]Since we collect data in one round only and have fewer observations for these regressions, we reduce the number of fixed effects estimated in the closer years sample by replacing individual graduation year fixed effects with an indicator for graduating after the reform. The results are qualitatively similar with their inclusion as well.

to gynecology, or a 3.5 percent increase from average test scores. This is a substantial increase given that test scores have a narrow range between 64 and 98 percent. In this context, it is the difference between the pre-reform test scores of those who do not specialize, and those who specialize in medicine (which has lower average test scores among specialists), or those who specialize in medicine and those who specialize in surgery[22]. In suggestive results omitted for brevity, the greatest change in test scores relative to gynecology are for medicine specialists, followed by surgery specialists. This suggests that improvements to specialists' scores were larger at the lower tail of the score distribution. The results are qualitatively similar in columns 1-5 which are for the full sample of doctors, and in columns 6-10 are for the subsample of doctors that graduated within ten years of the first class affected by the reform (between 1987 and 2007). We show in section 4 that one implication of doctor test score improvements is greater care, for example in terms of time spent per out-patient.

Male doctors' test scores in treated fields increased relative to the male-only urology and female-only gynecology by 5 percent and 3.7 percent relative to the mean, respectively (table B.12), which implies that competition improved male doctors' test scores. The test scores of female doctors could decrease due to the removal of the women's quota, and average test scores in gynecology and in non-gynecology would change based on how women sort into these specialties. In the lower panel of table 4, we restrict our sample to female doctors. The average test score of pre-reform female doctors is 89.53, and post-reform is 89.26, which implies that marginal female doctors were not substantially lower-scoring than infra-marginal female doctors[23]. The change in female test scores is also not significantly different between treated fields and gynecology for medical doctor cohorts around the reform (4, column 6), which suggests that sorting into gynecology and non-gynecology did not drastically differ along the dimension of test

[22]Gynecology is the highest scoring speciality on average before the reform (90.5 percent score), followed by surgery (87.6 percent score), medicine (83.3 percent score) and non-specialists (80.6 percent score).

[23]The average pre-reform male doctor test score is 85.98 and post-reform is 88.58.

scores.

New cohorts of doctors were, however, less well-connected to medicine through other doctors in the family. For example, column (9) of panel B suggests that treated female doctors after the reform had about three fewer doctors in their family than cohorts before the reform. This finding is consistent with admissions becoming merit-based overall. These results point to a profile of marginal female non-gynecologists as being from well-educated families, having fewer generational networks in medicine, and being similarly scoring as infra-marginal doctors.

Finally, to analyze selection into medical specialties along the dimension of preferences, we collected data on self-reported reasons for specializing in a given medical field. In figure 3, we separate these reasons by treated and control fields and for doctors who graduated before and after the reform. Pay is the most important reasons for choice of medical specialty in our sample across the board, with interest in the field often being second. There was an increase in treated individuals after the reform who mentioned interest in the field and short hours as factors that influenced their choice of medical specialty, however, a simple regression did not reveal significant changes[24]. Short work hours or flexibility are generally not the main reason for doctors' choice of medical specialty. This is reassuring because it indicates that non-gynecologists did not systematically sort into fields with shorter hours, which is related to some of our outcomes, such as output. One caveat in interpreting these responses is that they may suffer from social desirability bias and demand effects. While we cannot guarantee against those effects, actual specialty selection is consistent with stated preferences to some extent: Individuals who reported pay as their primary motivation for specialty choice are in specialties where the pay is Rs. 1,306 (54 percent of mean earnings) higher than those who did not, while those who selected shorter work hours are in fields where the pay is Rs. 1,561 (64 percent of mean earnings) lower than if not.

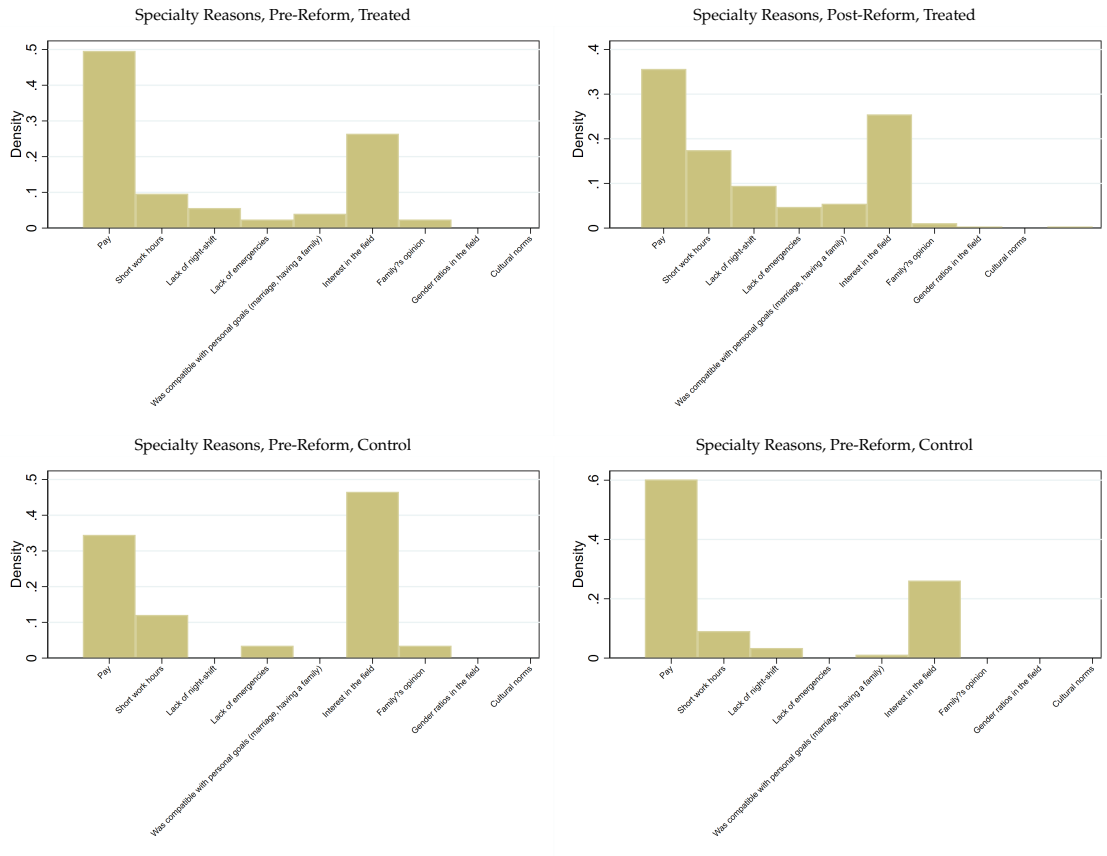
[24]The regressions are omitted here for space and available upon request.

	Test Scores (%)	Father's Education	Mother's Education	# Doctors in Family	Urban Birth	Test Scores (%)	Father's Education	Mother's Education	# Doctors in Family	Urban Birth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All										
Non-Gyn x Post	3.06*	-0.91**	-1.10***	-1.11*	-0.16	3.00*	-0.01	-0.11	-0.23	0.06
	(1.56)	(0.35)	(0.28)	(0.46)	(0.09)	(1.24)	(0.28)	(0.60)	(0.28)	(0.08)
Observations	242	250	250	250	250	153	157	157	157	157
R^2	0.37	0.24	0.36	0.51	0.33	0.19	0.15	0.27	0.21	0.20
Panel B: Female										
Non-Gyn x Post	9.27***	-0.11	2.66**	-4.04	-0.15	3.04	2.15*	4.55*	-3.07**	0.15**
	(1.41)	(0.75)	(0.79)	(0.78)	(0.09)	(2.76)	(0.34)	(1.64)	(0.82)	(0.03)
Observations	110	115	115	115	115	63	66	66	66	66
R^2	0.56	0.40	0.60	0.39	0.31	0.47	0.15	0.42	0.25	0.21
Mean DV	88.2	13.0	12.0	1.67	0.76	88.2	13.0	12.0	1.67	0.76
Closer Years	N	N	N	N	N	Y	Y	Y	Y	Y
Specialty Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Graduation Year Fixed Effects	Y	Y	Y	Y	Y	N	N	N	N	N

Note: The table presents the results of estimating 2 for the fee of medical doctors in treated fields relative to gynecology. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2 and survey round fixed effects. Data are from a survey of doctors conducted by the authors and Gallup Pakistan. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 4: Selection, Treated Doctors Relative to Gynecology

Figure 3: Reasons for Selecting a Medical Specialty



Note: The graph shows respondents' self-reported reasons for specializing in their medical specialty, with multiple factors allowed. Data are from a survey of Pakistani doctors conducted by the authors in 2021 and 2022.

4.2 Changes in Medical Practice and Implications for Patient Care

Fee charged per patient: In our survey we collected information on the consultation fee charged per patient by doctors at their primary practice and secondary practice, as well as their base hospital salary[25]. In figures A.5 and A.7, we plot the fee charged by doctors over cohorts in treated fields. Trends in consultation fee do not change substantially for doctors overall, but the fee charged by female doctors who graduated immediately after the reform is lower than of pre-reform cohorts.

Table 5 presents the results from equation 2 for the logarithm of fee charged per visit (conditional on the fee being positive) and the likelihood of no fee being charged for a doctor's primary and secondary practice (we report monthly salary and constructed total earnings in table B.5)[26]. There were no statitistically significant changes in fee or salary for all doctors over the full sample of cohorts (table 5, panel A, columns 1-3). For cohorts immediately around the reform, the likelihood that doctors charge no fee per patient is higher by 21 percentage points (table 5, panel A, column 5). Female doctors are twice as likely (44 percentage points) to charge no fee per patient (table 5, panel B, column 5), which suggests that the overall effect is driven by female doctors. In the last three columns of table 5, we control for test score data collected from round 2 of our survey to allow for selection differences due to doctor ability. The likelihood of charging zero fee decreases to 5 percentage points but remains statistically significant for female doctors. One implication for patients is that the cost of consulting with a female specialist, including high ability doctors, decreases.

We construct total earnings per month by combining base salary, the fee and number

[25]Even doctors who charge no consultation fee have a base take-home salary. Information on doctors' base salary was only asked in the second round of survey collection.

[26]A non-trivial number of doctors, and especially those who work in public hospitals, charge no fee (see figure A.2). Since the number of doctors that charge no fee is large, we did not trim the ends of the fee distribution, and we report results separately for charging a positive fee and for charging 0 fee.The average consultation fee in our data is Rs. 964 in private practice and Rs. 433 in public practice, which is 4 percent and 1.8 percent of average monthly wages in Pakistan in 2021, respectively[27].

of patients from each practice[28]. Female doctors who graduated after the reform have lower earnings, even when accounting for ability changes. Since salary did not decrease, the drop in earnings is likely due to more free patient consultations.

In figure 5 we plot event studies of how the fee charged per out-patient evolved over graduation year cohorts. The outcome is Log(Fee+1), which includes observations where a positive and a zero fee is charged. On average, the figures do not suggest strong pre-trends for all doctors and for female doctors in mixed fields relative to gynecologists. The fee charged decreased, however, for doctors who graduated immediately after the reform in mixed specialties relative to gynecology. From the main results, this is driven mostly by doctors who charged no fee for out-patient visits.

Surprisingly, pay for male doctors in treated fields was largely unchanged relative to gynecology or urology (table B.14). But post-reform female doctors are 24 percentage points more likely to consult for free than male doctors, and 83 percentage points more likely to do so when working in public hospitals which are cheaper (table B.11). The gender gap in fee overall worsened for women, but not statistically significantly. The gender gap is highest at the ends of the fee distribution for post-reform doctors: among the more expensive doctors (who charge more than the median fee), male doctors charge more, and more women consult for free at the lower end. Meanwhile, salary and earnings are on average not different from their male counterparts.

Sector of Work: Public vs. Private Practice We examine changes in where doctors work, especially for its relevance to the consulting fee charged. Gynecologists who graduated before the reform are relatively more likely to work in public, urban hospitals, while female non-gynecolgists from those cohorts are overrepresented in the private sector where they charged a fee 20 percent higher than the control in our data. The share of treated female doctors who work in public hospitals changed from 27 percent to 39

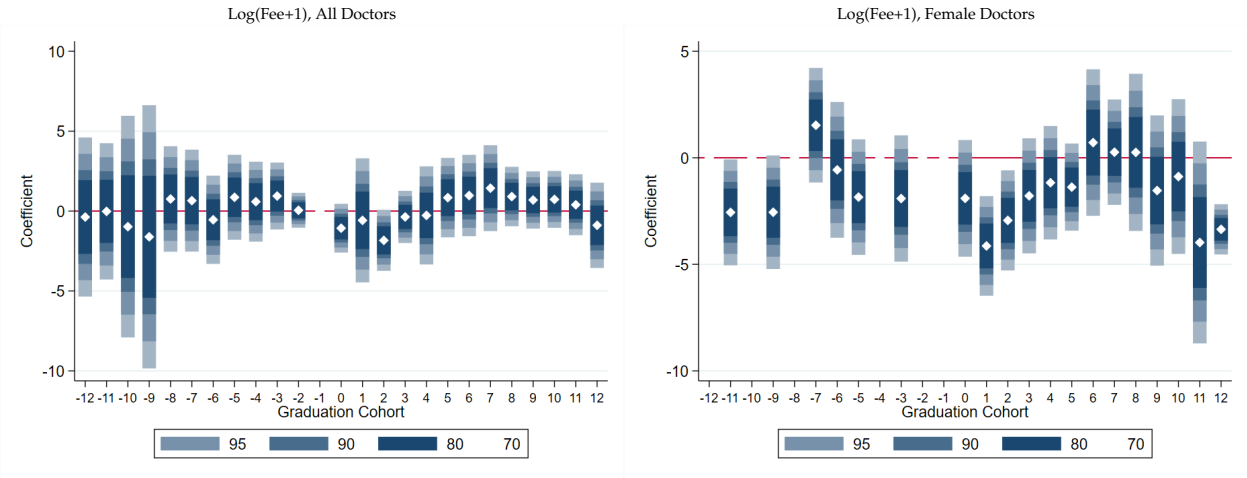
[28]This variable is created by first finding the midpoint of each salary categorical variable. For example, the midpoint of the salary range Rs."0-50,000" is Rs. 25,000. This midpoint is then added to the total fee earnings from both practices (Fee x number of patients consulted daily x 20 working days a month).

	Log(Fee) (1)	Pr(Fee=0) (2)	Log(Fee 2) (3)	Log(Fee) (4)	Pr(Fee=0) (5)	Log(Fee 2) (6)	Log(Fee) (7)	Pr(Fee=0) (8)	Log(Fee 2) (9)
A: All Doctors									
Non-Gyn x Post	0.56	0.07	0.62**	-0.09	0.21*	0.71*	-0.84	0.06	0.12
	(0.39)	(0.05)	(0.24)	(0.62)	(0.09)	(0.29)	(0.56)	(0.07)	(0.19)
Test Score (%)							0.05**	0.01**	0.08**
							(0.01)	(0.00)	(0.02)
Observations	478	610	168	214	284	97	113	150	45
R^2	0.22	0.23	0.49	0.23	0.20	0.39	0.23	0.31	0.73
B: Female Doctors									
Non-Gyn x Post	1.06	0.32**	0.36	0.13	0.44***	-0.85***	-0.76	0.05***	0.00
	(0.68)	(0.09)	(0.59)	(0.91)	(0.09)	(0.07)	(0.17)	(0.00)	(.)
Test Score (%)							0.04	-0.02***	-0.09
							(0.03)	(0.00)	(.)
Observations	226	279	60	83	105	30	45	61	16
R^2	0.31	0.43	0.81	0.42	0.49	0.89	0.09	0.60	0.92
Mean DV	5.0	0.25	3.77	4.9	0.25	3.77	4.9	0.25	3.77
Closer Years	N	N	N	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y†	Y	Y
Ability Control	N	N	N	N	N	N	Y	Y	Y

Note: The table presents estimates from equation 2 for the consulting fee per patient of medical doctors in treated fields relative to gynecology. "Log(Fee)" is defined for **non-zero fees**, while "Pr(Fee=0)" measures the probability that no fee is charged. Log(Fee 2) is the consulting fee per-patient at a secondary practice, if applicable, and is always positive. All regressions control for age, age-squared, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. "Closer years" refers to a subsample of the data of doctors who graduated within 10 years of the medical school reform. Stars represent statistical significance, standard errors are clustered at the medical specialty level. Data are from a survey of Pakistani doctors conducted by the authors. † For column 7, we removed specialty and graduation year fixed effects because of a small sample size. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 5: Pay, Treated Doctors Relative to Gynecology

Figure 5: Pay, Treated Doctors Relative to Gynecology



Note: The graph shows event studies of Log(Fee+1) estimated using equation 3, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors conducted by the authors in collaboration with Gallup Pakistan.

percent for graduates before and after the reform.

Relative to the same cohorts of gynecology, doctors in treated fields who graduated after the reform are currently 29 percentage points more likely to practice in public hospitals (table 6, column 4)[29]. But this change is twice as large for female post-reform doctors, who are 61 percentage points more likely to be public practitioners in 2022. Cohorts of doctors in treated fields are increasingly likely to be working in public hospitals, as specialists became more common (figures A.5). For female doctors, there is a slight increase in public practice among post-reform cohorts (figure A.5). The larger change relative to gynecologists for treated female doctors is therefore likely due to the latter being rare in public practice before. Female doctors are also more likely to work in public practice compared to their male counterparts in treated fields (table B.11). In fact, female doctors have displaced male doctors the most in small public hospitals after the reform (table B.4). Finally, we find that treated cohorts of doctors were more likely to

[29]Note that since most women in our sample work in urban areas, we often did not have sufficient data to examine changes in urbanity.

have *started* their career by completing a residency at public hospitals (table 6, columns 4 and 7, panel 2A and 2B). Doctors who complete their residency in a public hospital are 42 percent more likely to be in public practice in 2022 in our data. The reform therefore changed where initial cohorts started their career, which could create some persistence in where doctors practice.

We verify our results with the PMDC doctor registration data which contains the census of doctor registrations. The share of female specialists in treated fields who specialized at a public hospital increased after the reform (figure 9)[30][31]. Within treated specialties, the share of female specialists in public hospitals was 26 percent before the reform, and more than doubles to 56 percent after the reform[32]. The total number of registrations in private hospitals is also about 4 percent of those in public universities, which indicates that changes in public universities dominate overall trends.

Place of work as a reason for fee decline: Our consulting fee results could be driven by more treated specialists working in public hospitals relative to gynecology, so we separate our main outcomes for doctors who work in public and private hospitals[33]. The likelihood of consulting for free did not significantly change in public hospitals (table B.10, panel A, column 1), but female doctors in public hospitals are more likely to charge no fee relative to female gynecologists in public hospitals (panel B, column 1). This suggests that the increase in table 5 is at least partly due to an increase in the likelihood of working in the public sector, and not due to changes within the public sector. In contrast, there were no females in private hospitals who consulted for free.

[30]The PMDC data does not cover information on medical residency. But medical specialization occurs immediately after completing a residency.

[31]The horizontal axis plots the year of initial medical license issue for medical doctors, and the vertical lines indicate when the first class affected by the reform would be likely to receive their first medical license (applications for the license can begin a year before expected graduation).

[32]This increase is from 34 percent to 57 percent at private hospitals, a change of 23 percentage points.

[33]Place of work is an endogenous choice variable. Therefore, we treat these regressions as non-causal but suggestive of the underlying mechanisms at play. Thirty-five percent of female and 39 percent of male doctors in public practice charge no fee in our data. The analogous numbers are 5 percent and 6 percent for female and male doctors in private practice, respectively.

We consider two additional reasons for the fee decline in mixed fields: a lack of faculty promotions and beliefs about gender discrimination (table B.6)[34]. In the basic regression (column (1)) and the regression with all fixed effects (column (2)), cohorts in mixed fields are about 18 percentage points more likely to have been promoted after the reform than in gynecology. While this does not rule out the fact that a glass ceiling in promotion can affect pay, it suggests that doctors in mixed fields are not particularly constrained in promotion relative to gynecologists.

On the other hand, doctors in fields where females are recent entrants are more likely to believe that customer-based discrimination affects their pay (table B.6)[35]. These responses are conditional on believing that a gender pay gap exists. Interestingly, cohorts who graduated within ten years of the reform are more likely to believe that customer-based discrimination affects pay. These results should be interpreted with caution, since they are based on a small number of observations. We show event studies on beliefs regarding discrimination in figure A.3.

[34]In columns (1)-(2) the outcome is an indicator which equals 1 if the respondent is an Associate or Full Professor, which implies they were promoted at least once in their career. It equals 0 if they are an Assistant Professor or in none of these roles.

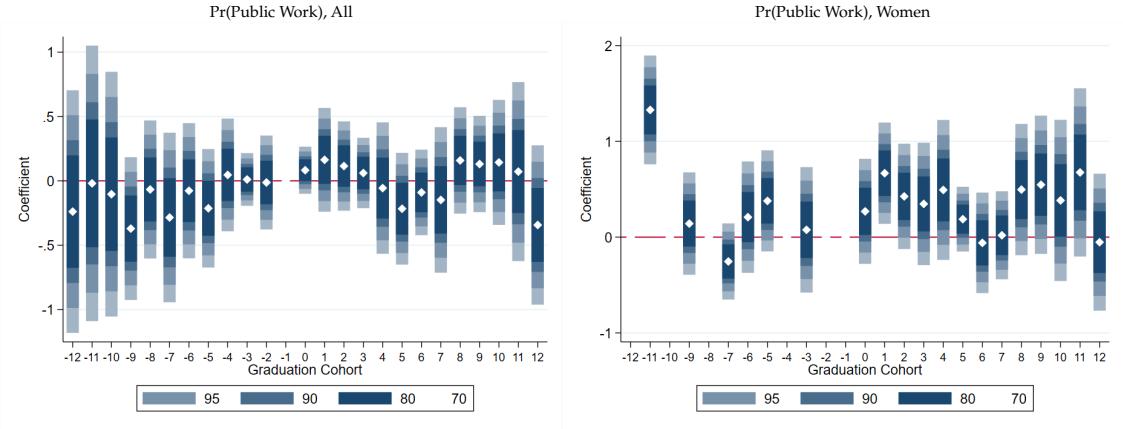
[35]The outcomes in columns (3)-(4) and columns (5)-(6) of table B.6 are indicators for whether respondents believe that the gender pay gap in medicine is due to employer discrimination and patient discrimination, respectively. The question on patient discrimination asked if patients are more comfortable with or more likely to seek out a doctor of a specific gender.

	Probability of Working in:								
	Public (1)	Urban (2)	Large (3)	Public (4)	Urban (5)	Large (6)	Public (7)	Urban (8)	Large (9)
1A: All Doctors, Current Workplace									
Non-Gyn x Post	0.11**	0.07	0.01	0.29***	0.05	-0.03	0.22**	-0.02	-0.24***
	(0.04)	(0.05)	(0.07)	(0.07)	(0.07)	(0.04)	(0.08)	(0.07)	(0.04)
Observations	615	615	615	286	286	286	152	152	152
R^2	0.15	0.13	0.20	0.14	0.20	0.20	0.28	0.23	0.29
1B: Female Doctors, Current Workplace									
Non-Gyn x Post	0.25	0.10	0.23**	0.61**	0.10	0.10	0.27***	0.00	-0.13*
	(0.19)	(0.08)	(0.07)	(0.21)	(0.21)	(0.13)	(0.00)	(.)	(0.05)
Observations	282	282	282	106	106	106	62	62	62
R^2	0.22	0.26	0.21	0.28	0.45	0.38	0.48	.	0.38
2A: All Doctors, First Workplace									
Non-Gyn x Post	-0.05	-0.01	0.01	0.15*	0.06	0.03	0.20***	0.08	-0.00
	(0.05)	(0.04)	(0.07)	(0.07)	(0.08)	(0.03)	(0.04)	(0.10)	(0.03)
Observations	643	643	643	299	299	299	153	153	153
R^2	0.16	0.24	0.17	0.11	0.14	0.09	0.17	0.25	0.19
2B: Female Doctors, First Workplace									
Non-Gyn x Post	-0.29**	-0.14	0.09	0.09	-0.08	0.16	0.32*	0.00	-0.06
	(0.08)	(0.07)	(0.11)	(0.15)	(0.12)	(0.14)	(0.11)	(.)	(0.04)
Observations	292	292	292	110	110	110	63	63	63
R^2	0.19	0.49	0.21	0.25	0.49	0.32	0.41	.	0.36
Mean DV	0.5	0.9	0.8	0.6	0.9	0.8	0.6	0.9	0.8
Closer Years	N	N	N	Y	Y	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	N	Y	Y	Y

Note: The table presents the results of equation 2 for the medical doctors' place (sector) of work in treated fields relative to gynecology. All regressions control for age, age^2, grouped specialty, graduation year and survey round fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, all other specialties and no specialty. Stars represent statistical significance, standard errors are clustered at the specialty level. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

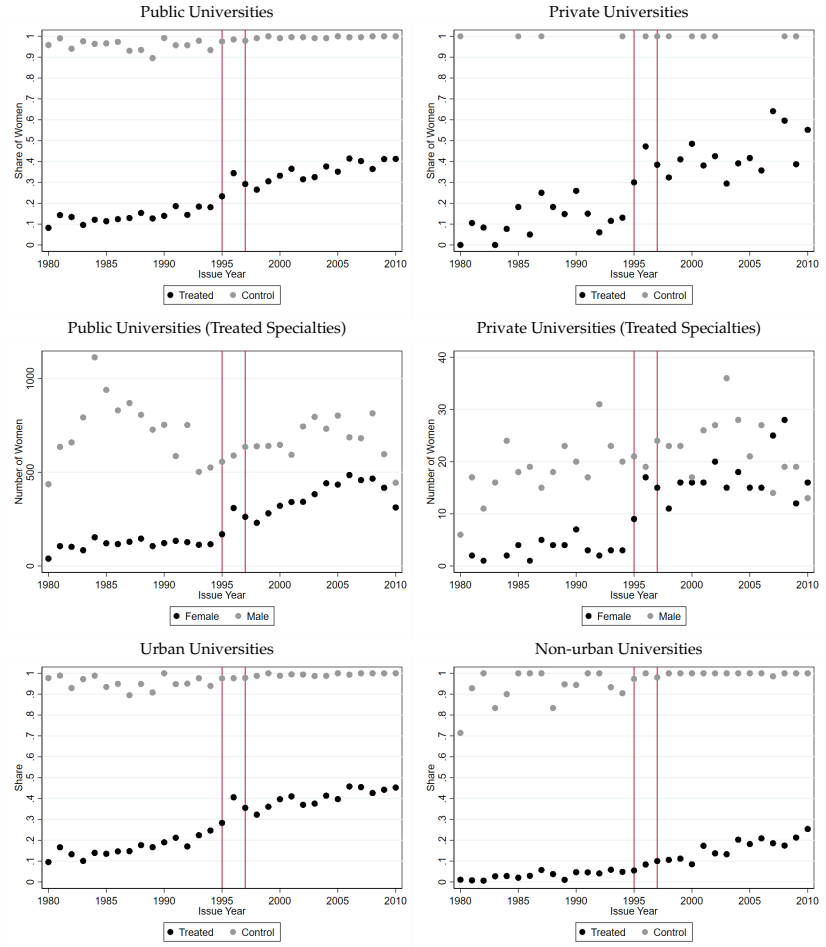
Table 6: Place of Work, Treated Doctors Relative to Gynecology

Figure 7: Place of Work, Treated Doctors Relative to Gynecology



Note: The graph shows event studies of place of work estimated using equation 3, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors collected by the authors.

Figure 9: Female Share of Doctors by Type of Specialization University



Note: The graphs depict the female share and number of doctors who specialized at different types of universities. The share is calculated as the number of females over the total number who specialized at a given type of hospital. Data are from the PMDC data of medical doctor registrations.

Patient Complaints and Disciplinary Cases against Doctors In 2022, the PMDC published records of medical complaints and disciplinary action cases between 2011 and 2021 on its website. We collected this information from the 185 cases available on the PMDC website and matched it with doctors from the registration data using doctors' medical IDs[36]. About 65 pecent of the accused doctors are male, and 82 percent of complaints are registered by men (table 7). In 41 percent of the cases, the complaint was made after a patient died, and the two most common complaints are negligence (50 percent of cases) and having a fake license (or doing a task one is not authorized to do) (13 percent of cases). License revokation or suspension is generally a more serious penalty than a fine or warning, though the three are not mutually exclusive.

In table 8 we present differences in means between groups. While the overall female share in medical registrations was 57 percent after the reform, the female share of penalties was 20 percent. About three-quarters of complaints are against male doctors. In simple OLS regressions, a 1 percent increase female share is associated with a decreased likelihood of a complaint by 0.0011 percent or 14 percent relative to the mean penalty rate (table 10). Simultaneously, the likelihood that a female doctor is accused increases by 0.9 percent. When age and highest qualification are accounted for, a 1 percent increase in the female share is linked to a 0.97 percent increase in the share of compaints against female doctors. This suggests that much of the initial difference is due to differences in seniority between men and women. This is supported by the fact that almost 60 percent of cases against women are in gynecology, and the remaining in fields where women are relative newcomers[37].

After the reform plausibly exogenously increased the supply of female doctors, there were no major changes between treated fields and gynecology, which may be because

[36]The documents usually (though not always) include the names of the complainant, the names of the accused doctors, the nature of the complaint and some details about the case.

[37]The complaints in gynecology are also more serious: for pre-reform graduates 86 percent of cases are due to a patient dying and the accusation is negligence. This decreases to 47 percent dying and 88 percent accusations of negligence, respectively.

gynecology has fewer cases than treated fields as a whole. However, male doctors are 50 percent more likely to have their license suspended or revoked compared to female doctors in treated fields, even conditional on seniority (panel B, table 9). There is suggestive evidence that women are 11 percentage points more likely to be accused of negligence toward a patient, and 4 percentage points more likely to have a case filed when a patient died. However, these differences are not statistically significant.

	Mean	SD	Min	Max	N
	.				
Male Accused	0.64	0.48	0.00	1.00	177
Male Complained	0.82	0.39	0.00	1.00	137
Patient Died	0.44	0.50	0.00	1.00	163
Complaint: Negligence	0.49	0.50	0.00	1.00	185
Complaint: Fake License	0.11	0.32	0.00	1.00	185
Fined	0.17	0.37	0.00	1.00	185
License Suspend or Revoke	0.34	0.47	0.00	1.00	185
Warning Issued	0.12	0.32	0.00	1.00	185

Note: The table presents summary statistics for patient complaints collected from the PMDC website. The years of the complaints range from 2011 to 2022.

Table 7: Summary Statistics: Patient Complaints

Output In table 11 we measure the daily number of patients that doctors consult with and the time spent with each patient. We first sum each of these variables for primary and secondary practices. For doctors overall (panel A) and for female doctors (panel B), the number of patients consulted daily grew over time relative to gynecology. The overall increase is a substantial 37 percent of the mean of 32 patients a day, and reflects a broad trend where specialists consulted with more patients relative to gynecology. At the same time as the number of patients increased, the average time spent per patient for all doctors did *not* decrease. Time per patient is measured through a categorical variable which increases in units of 5 minutes. An increase of 0.87 units in table 11, column 4, represents an increase by 4.35 minutes spent with each patient. For female doctors, the results on time spent per patient are mixed, and change from an increase in time spent to

	μ_1	μ_2	Difference	SE	N
Treated Doctors: Post (μ_1) vs. Pre (μ_2)					
Male Accused	0.73	0.77	0.04	0.07	144
Male Complained	0.87	0.88	0.02	0.07	103
Patient Died	0.32	0.44	0.12	0.09	129
Complaint: Negligence	0.36	0.44	0.08	0.08	151
Complaint: Fake License	0.19	0.05	-0.14***	0.05	151
Fined	0.13	0.19	0.06	0.06	151
License Suspend or Revoke	0.34	0.47	0.13	0.08	151
Warning Issued	0.13	0.06	-0.07	0.05	151
Gynecologyists: Post (μ_1) vs. Pre (μ_2)					
Male Accused	0.17	0.20	0.03	0.14	33
Male Complained	0.63	0.67	0.04	0.17	34
Patient Died	0.58	0.87	0.29*	0.15	34
Complaint: Negligence	0.89	1.00	0.11	0.07	34
Complaint: Fake License	0.05	0.00	-0.05	0.05	34
Fined	0.11	0.33	0.23	0.15	34
License Suspend or Revoke	0.00	0.20	0.20*	0.11	34
Warning Issued	0.16	0.20	0.04	0.14	34
Treated Doctors: Female (μ_1) Vs. Male (μ_2)					
Male Accused	0.00	1.00	-1.00	0.00	144
Male Complained	0.89	0.88	0.01	0.08	99
Patient Died	0.26	0.42	-0.16	0.10	122
Complaint: Negligence	0.25	0.46	-0.21**	0.09	144
Complaint: Fake License	0.22	0.10	0.12	0.08	144
Fined	0.06	0.20	-0.15***	0.05	144
License Suspend or Revoke	0.33	0.44	-0.10	0.09	144
Warning Issued	0.14	0.09	0.05	0.06	144

Note: The table presents the differences in means between pre-reform and post-reform doctors within treated and control fields, separately. Pre-reform refers to doctors who graduated before the reform, and post-reform analagously. Treated group refers to non-gynecologists and control group to gynecologists. Data are collected from the PMDC website. The years of the complaints range from 2011 to 2022.

Table 8: Differences in Means by Groups: Complaints and Penalties

	Patient Died	Fake License	Negligence	License Revoked /Suspended	Warning Issued	Fined
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Treated x Control						
Post x Treated	-0.03	0.14	-0.01	0.08	0.28	0.04
	(0.21)	(0.14)	(0.15)	(0.15)	(0.18)	(0.18)
Treated	-0.43***	0.06*	-0.58***	0.27**	-0.13	-0.13
	(0.11)	(0.03)	(0.07)	(0.11)	(0.12)	(0.13)
Post	0.03	-0.08	0.01	0.06	-0.22	0.15
	(0.26)	(0.17)	(0.21)	(0.19)	(0.21)	(0.21)
Observations	115	133	133	133	133	133
R^2	0.19	0.13	0.24	0.15	0.07	0.15
Panel B: Male x Post in Treated Fields						
Post x Male Accused	0.01	-0.07	0.08	0.54**	-0.00	0.04
	(0.24)	(0.18)	(0.21)	(0.22)	(0.16)	(0.12)
Male Accused	0.12	-0.10	0.17	-0.15	0.02	0.16
	(0.19)	(0.10)	(0.15)	(0.15)	(0.08)	(0.10)
Post	0.04	0.08	-0.06	-0.27	0.01	0.19
	(0.26)	(0.20)	(0.23)	(0.25)	(0.15)	(0.14)
Observations	87	105	105	105	105	105
R^2	0.11	0.18	0.06	0.12	0.12	0.23
Mean DV	32	13	32	13	32	13
Controls	Y	Y	Y	Y	Y	Y

Note: The table presents the results of estimating 2 for medical complaints faced by doctors. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2, and highest qualification (a basic medical M.B.B.S degree or specialization). Data are from the PMDC website. The years of the complaints range from 2011 to 2022. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 9: Disciplinary Action

	Penalty		Male Accused		
	(1)	(2)	(3)	(4)	(5)
Female Share by Specialty and Year	-0.00***	-0.91***	-0.74***	-0.89***	-0.71*
	(0.00)	(0.12)	(0.18)	(0.14)	(0.41)
Highest Qualification: MBBS				-0.22	-0.06
				(0.19)	(0.20)
Highest Qualification: Specialization				-0.14	-0.03
				(0.20)	(0.24)
Age				0.02	0.00
				(0.03)	(0.03)
Age Squared				-0.00	-0.00
				(0.00)	(0.00)
Observations	245,997	133	101	133	101
R^2	0.00	0.29	0.15	0.31	0.15
Mean DV	32	32	13	32	13
Samples	All	Penalty	Penalty, Treated	Penalty	Penalty, Treated
Controls	Y	Y	Y	Y	Y

Note: The table presents the results of estimating 2 for medical complaints faced by doctors. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2, and highest qualification (a basic medical M.B.B.S degree or specialization). Data are from the PMDC website. The years of the complaints range from 2011 to 2022. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 10: Disciplinary Action, Simple OLS

a decrease when test scores are controlled for.

Examining doctor practices separately by primary and secondary practice sheds further light on these results (table B.7). Almost the entire increase in patients consulted with per day is at a secondary practice, while there is no change in the patients or time spent per patient in primary practice overall[38]. Female doctors, however, *decrease* the time spent per patient at their primary practice by 4.4 minutes per patient. When accounting for ability, the decrease in time is 2.35 minutes per patient, since high ability female doctors spend more time per patient (column 6, panel B, table B.7). This finding is further substantiated by event studies relative to gynecology in figure 11, and with no other control group in figure A.7. Though our sample sizes are small, we have suggestive evidence that the decrease in time spent per patient in primary practice is largely driven by female doctors with a secondary practice, who plausibly face a greater time cost[39]. Consistently, female doctors also lowered consulting hours at their primary practice (column 4, table B.9). Controlling for ability, we find that the smartest female doctors have fewer consulting hours and greater practice hours, which could be because they spend more time conducting medical procedures.

In contrast, male doctors in treated fields spend the same amount of time and did not change their consulting hours relative to gynecology. Relative to the male dominated field of urology, male doctors in treated fields see 10 fewer out-patients and spend about 2.5 *more* minutes per out-patient after the reform (table B.15). Female doctors spend less time per patient than male doctors within treated fields (table B.11), but the difference is not statistically significant. Finally, male doctors also report less burnout and are less likely to cut back on hours relative to gynecology, but female doctors are more likely to

[38]This is part of a broad trend among specialists relative to gynecologists to work in public hosiptals, have a secondary practice, consult with more patients and spend more time per patient at their secondary practice. Doctors with a primary practice in the public sector have an incentive to have a second practice in the private sector, due to the substantial difference in pay and fee between the two sectors. Forty percent of doctors with a public primary practice have a secondary practice in our data, while 16 percent of doctors with a private primary practice do. Female doctors participate in this trend as they respond to labor market incentives (see column 4, table B.8).

[39]These results are available upon request.

do so (table B.19).

A second response to time constraints for female doctors is in patient consultation timings. Relative to gynecology, there is an increase in treated doctors consulting during the afternoon and morning. However, for female doctors, the increase in morning or afternoon shifts is twice as large as for doctors overall. This is offset by a decrease in overnight shifts for female doctors. As the share of female doctors increased, we observe a greater tendency for consultation hours to be in the afternoon, with some decrease in the evening table 12.

Overall, our findings suggest that as female doctors enter new specialties, they become integrated and adapt to norms, such as by starting secondary practices. At the same time, they operate with different time constraints. Unlike men, therefore, they compensate for the increased consulting time and higher patient loads by reducing the time per person at their primary practice.

5 Robustness Checks and Extensions

Using Pre-Existing Shares of Female Doctors: Since the individual pre-existing female shares for specialties are scattered, we group medical specialties into 4 groups: no specialty, surgery, medicine and gynecology. The pre-reform female shares in these specialties are 0.29, 0.03, 0.17 and 0.94, respectively. We then create a variable "Shares" that equals 1 minus the pre-existing share which captures potential for growth in female share after the reform in each group, and replace our treatment indicator in equation 3 with this new variable[40], where standard errors are clustered at the specialty group "share". Consistent with our main results, our results imply that fields where the female share could grow more after the reform experienced an increase in doctors working in

[40]For example, the room for growth in surgery's female share is 0.97. The full equation estimated is

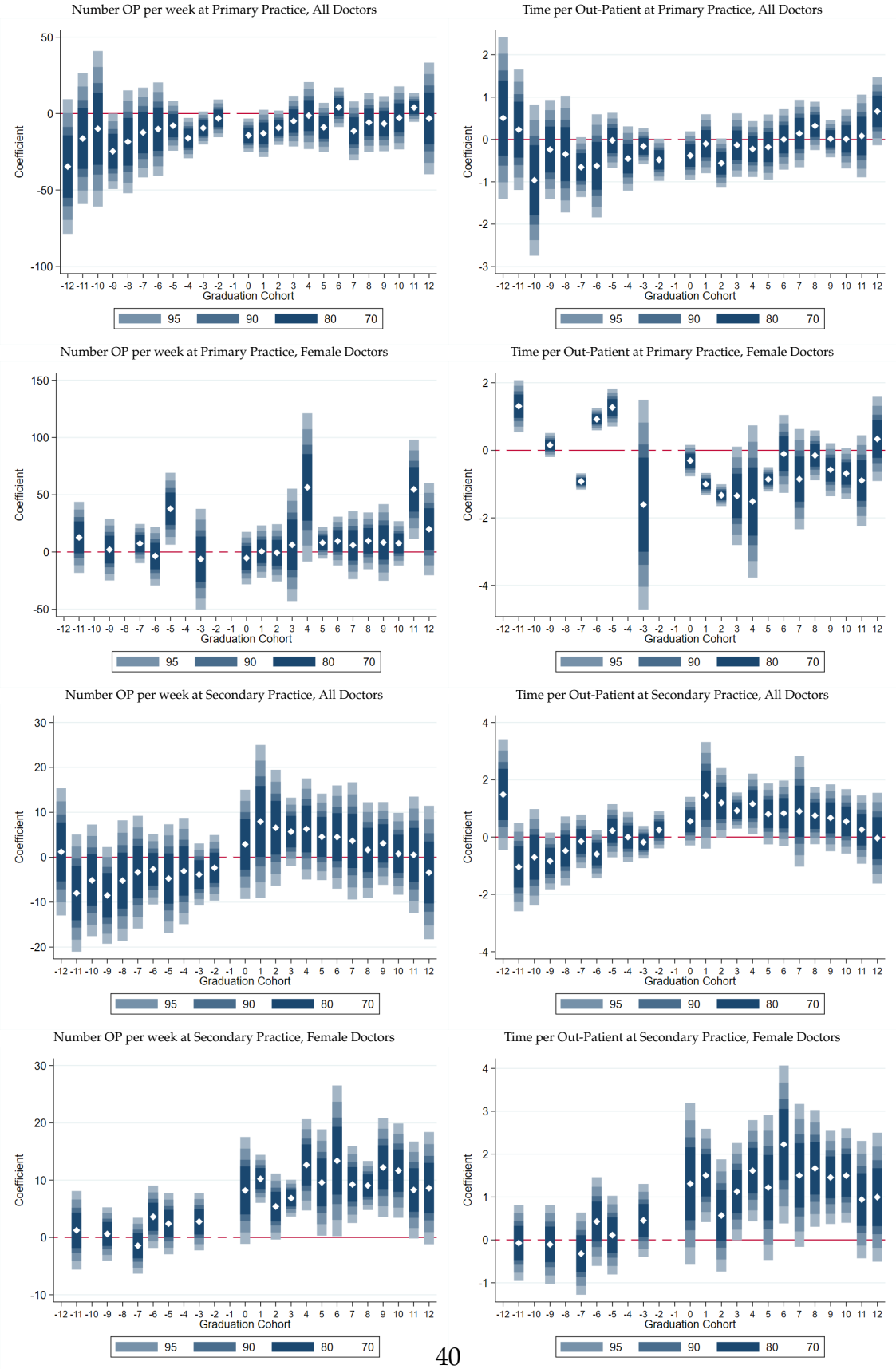
$$Y_{ist} = \beta_0 + \beta_1(Shares * Post)_{st} + \beta_2 Shares_s + \gamma X_{ist} + \alpha_r + \alpha_t + u_{ist} \quad (4)$$

	Number of Out-Patients (1)	Time per Out-patient (2)	Number Out-Patients (3)	Time Out-patient (4)	Number Out-Patients (5)	Time Out-Patients (6)
Panel A: All Doctors						
Non-Gyn x Post	5.64*	1.00***	12.04***	0.87***	13.79***	0.32
	(2.68)	(0.25)	(2.98)	(0.20)	(2.48)	(0.38)
Test Score (%)					-0.17	-0.09**
					(0.59)	(0.03)
Observations	644	644	299	299	153	153
R^2	0.16	0.13	0.21	0.15	0.37	0.29
Panel B: Female Doctors						
Non-Gyn x Post	15.88*	0.90*	31.16*	0.42	6.47*	-0.56*
	(6.20)	(0.44)	(14.58)	(0.43)	(2.68)	(0.20)
Test Score (%)					-1.91***	-0.10***
					(0.13)	(0.01)
Observations	292	292	110	110	63	63
R^2	0.25	0.18	0.35	0.16	0.42	0.37
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	N	N	Y	Y
Ability Control	N	N	N	N	Y	Y

Note: The table presents the results of equation 2 for the number of out-patients consulted by doctors per day and the time spent with each out-patient. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects included are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 11: Output, Treated Doctors Relative to Gynecology

Figure 11: Output, Treated Doctors Relative to Gynecology



Note: The graph shows event studies of doctor output estimated using equation 3, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors collected by the authors.

	Morning (1)	Afternoon (2)	Evening (3)	Overnight (4)	Morning (5)	Afternoon (6)	Evening (7)	Overnight (8)
Panel A: All Doctors								
Non-Gyn x Post	0.09	0.27**	0.12	0.03	0.05	0.30***	0.13	-0.01
	(0.09)	(0.10)	(0.21)	(0.04)	(0.13)	(0.06)	(0.16)	(0.06)
Test Score (%)					0.01	-0.01	-0.01	-0.00
					(0.01)	(0.01)	(0.01)	(0.00)
Observations	287	287	287	287	153	153	153	153
R^2	0.15	0.18	0.11	0.10	0.21	0.31	0.31	0.13
Panel B: Female Doctors								
Non-Gyn x Post	0.18***	0.09	-0.01	0.02	-0.12	0.65***	-0.01	-0.97***
	(0.02)	(0.05)	(0.08)	(0.02)	(0.08)	(0.08)	(0.13)	(0.00)
Test Score (%)					-0.05***	0.05***	0.01	-0.00***
					(0.00)	(0.00)	(0.01)	(0.00)
Observations	107	107	107	107	63	63	63	63
R^2	0.25	0.05	0.17	0.06	0.47	0.50	0.49	0.41
Mean DV	0.81	0.62	0.38	0.02	0.81	0.62	0.38	0.02
Closer Years	Y	Y	Y	Y	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	Y	Y	Y	Y

Note: The table presents the results of equation 2 on the timings of work shifts for treated fields relative to gynecology. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. To limit the size of the table, only results for doctors who graduated within 10 years of the reform are shown. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 12: Work Timings, Treated Doctors Relative to Gynecology

public hospitals, an increase in zero consulting fees, and female doctors spending less time per out-patient.

	Public Practice All Doctors	Zero Fee All Doctors	Time/OP Female Doctors
	(1)	(2)	(3)
Using Pre-Existing Female Shares			
Pre-Existing Female Share x Post	0.35**	0.29**	-0.90*
	(0.17)	(0.14)	(0.44)
Observations	286	284	110
R^2	0.10	0.16	0.24
Grouping Specialties: Surgery and Non-Surgery			
Non-Gyn x Post	0.29**	0.22*	-0.78*
	(0.07)	(0.08)	(0.32)
Observations	286	284	110
R^2	0.11	0.16	0.25
Specialists Only			
Non-Gyn x Post	0.35**	0.27**	-0.72**
	(0.09)	(0.10)	(0.14)
Observations	254	252	106
R^2	0.18	0.24	0.33
Re-weighting Public and Private Doctors			
Non-Gyn x Post	0.26**	0.52***	-0.79**
	(0.08)	(0.09)	(0.20)
Observations	286	105	106
R^2	0.12	0.53	0.40
Placebo Treatment Year=1987, Sample Range:1970-1996			
Non-Gyn x Post	-0.23***	-0.06	0.54
	(0.06)	(0.08)	(1.21)
Observations	204	201	67
R^2	0.19	0.22	0.34

Note: The table presents robustness checks for our main results. In panel A, we use the pre-existing share of female doctors in grouped medical specialties, in panel B we change the grouping of medical specialties to surgery and non-surgery. In panel C we restrict the data to medical specialists, and in panel D we use a placebo reform year, 1987, while restricting the sample to 1970 and 1996. In panel E, we re-weight the data to account for the probability of non-response. Data are collected by the authors in 2022 and 2023.

Table 13: Robustness Checks

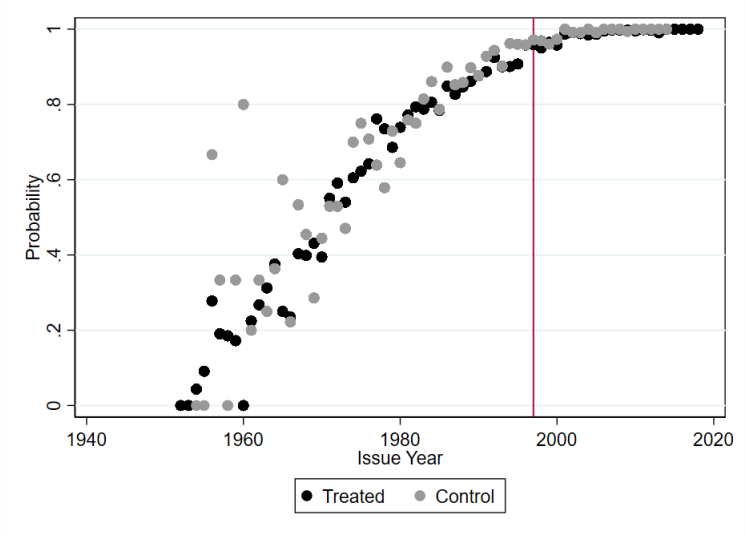
Accounting for Survivor Bias: We interviewed medical doctors in 2021 and 2022, almost two decades after the 1992 reform. Because of the passage of time, many doctors could have dropped out of the labor force, and we are more likely to capture "survivors": doctors who are still practicing in 2021 and 2022 and therefore have long careers. These could be doctors selected on ability or performance, which implies that some of our estimates, such as of the ability of doctors who graduated before the reform, could be over-estimated.

To address this concern, we look for differential trends in the likelihood of being active in 2015, which was our cutoff year in sampling. In other words, we had randomly sampled names of doctors who were active in 2015 or after, and provided this list to the survey team (while oversampling gynecology and urology). When we plot the likelihood of being active in 2015 of after, however, we find that treated and non-treated specialists who were issued a license in a given year are similarly likely to be active in 2015. This suggests that while we are more likely to find doctors who are active closer to the current year, there are no strong differences in this likelihood between our treated and control groups.

Specialists Only: Since MBBS doctors and specialists may have different experiences and trends, we repeat our analysis with the exclusion of all 109 MBBS doctors in our sample (table 13). Most of our results remain consistent, and are in fact stronger. One exception is the decrease in time spent per out-patient by female doctors in column (3). These results imply that our results of a higher likelihood of public practice and charging no fee are persistent among and may be driven by female specialists. The reform-induced change in gender ratios led female specialists to be located in public hospitals, and practice accordingly.

Weighting for non-response: In our data, almost 51 percent of respondents are in the private sector, whereas nationally only 35 percent of doctors work in private hospitals.

Figure 13: Probability of Having a Valid License in and after 2015



Note: The figure plots the likelihood that a doctor has a valid license in and after 2015 against the year of initial medical license issue, for medical specialists in treated and control categories. Data are from the PMDC medical doctor registration database.

While we randomized the list of doctors we provided to the survey team, and the survey team did not report different non-response rate by private practice, there might de facto be different response rates between doctors working in the public and private sectors. In this section we use weights to adjust the share of public and private doctors in our sample. The weights are calculated by adjusting the share of private doctors in our sample to match their share in the population, and the same for public doctors. The results in table 13 remain consistent with our main findings.

Placebo Treatment: To test if our results are driven by trends over time, we create a placebo policy in 1987, which is 10 years before the reform (table 13). We restrict our analysis from 1970 to 1996, and include the time period between 1970 and 1977 to allow for a greater number of observations in the placebo policy pre-period. Overall, most results are substantially different from our main results. For example, doctors in treated fields are significantly less likely to be in public practice, and the likelihood of charging no fee is not statistically different from 0. This suggests that our trends are not driven by

trends in health care practice over decades.

6 Conclusion

In this paper we examine how a Pakistani reform that changed gender ratios in medicine affected medical practice. We collect survey data on more than 600 doctors across all provinces in Pakistan. The data allow us to follow cohorts of medical graduates affected by the reform in "mixed", or, treated fields, relative to gynecology and urology, which were two relatively homogenous fields that remained untreated for cultural reasons.

We find that female doctors in treated fields relative to gynecology became more likely to charge no fee after the reform, which led to an average decline in the fee charged per out-patient. They also consulted with more out-patients per week and spent less time on each out-patient. These patterns are consistent with female doctors' higher likelihood of working in the public sector. This suggests that place of work contributes substantially to work styles.

Our results are strongest for the cohorts of doctors who were the first to be affected by the reform. Even as gender ratios changed in treated fields, medical practice became segmented by gender for these initial cohorts, who also became more likely to start their careers in public hospitals relative to gynecologists. While we do not have the data to substantiate this, one potential explanation could be that when female specialists were few, they were overrepresented in the private sector and were unable to find public sector jobs either because of hiring discrimination or due to personal preferences. It was only when female specialists became more abundant that some female specialists inevitably had to join the public sector as well. In the meantime, patients' access to high quality healthcare from female specialists became easier and cheaper.

While our study has several findings on the medical labor market and doctor welfare, it can make few claims about patient outcomes, since this data is highly sensitive and

difficult to collect. Most doctors are not open to discussing the outcomes (such as the mortality) of their patients. The next steps in this literature would be to find a way to directly or indirectly measure how patient well-being is affected when the gender ratios in medicine change.

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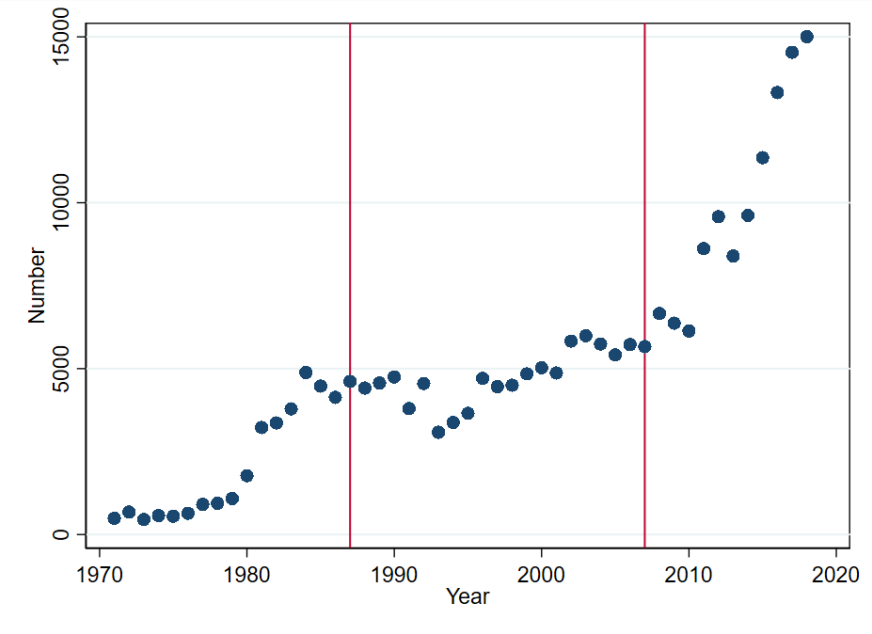
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A Appendix

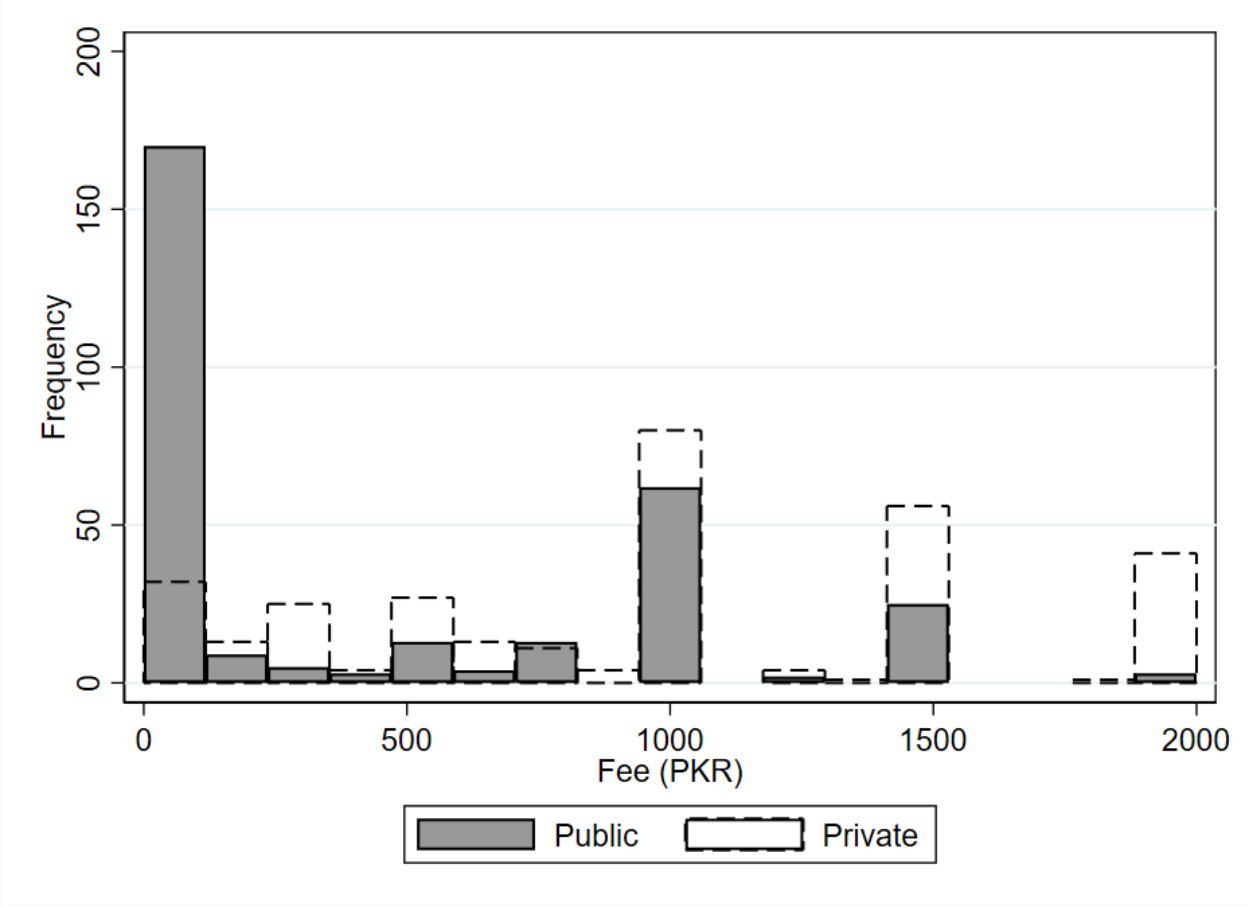
A.1 Figures

Figure A.1: Total Number of Medical Doctor Registrations



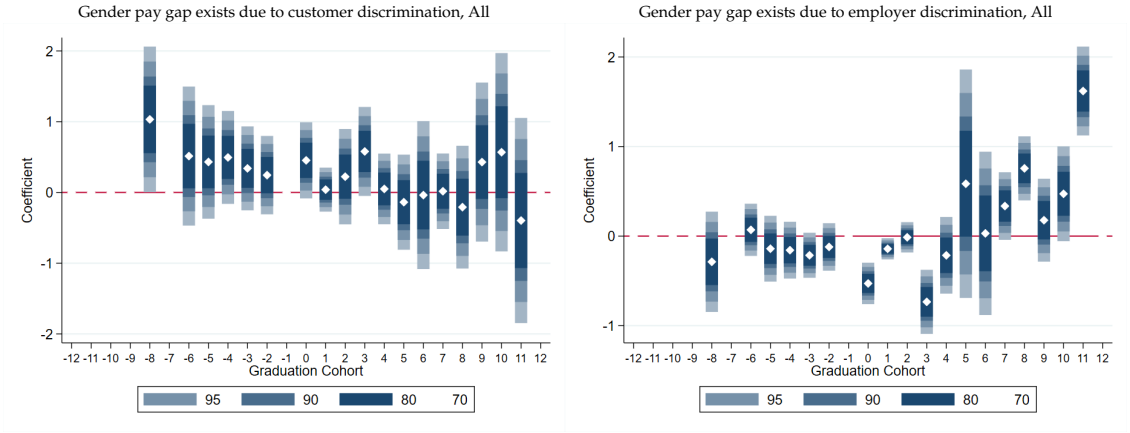
Note: The graph plots the total number of registrations by year, where year is the year of initial medical license issue. Data are from the PMC Medical Doctor Database between 1952 and 2018.

Figure A.2: Fee, Public and Private Hospitals



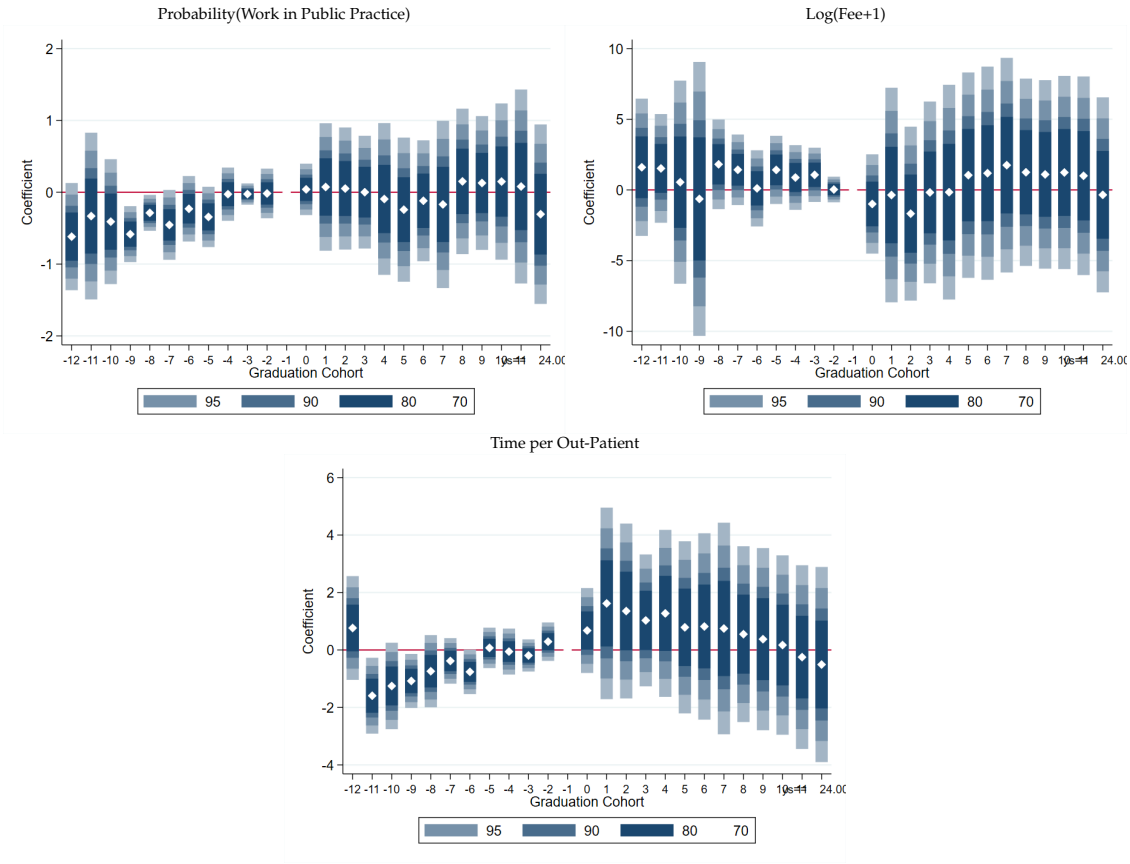
Note: The graph shows a histogram of fee from the primary practice of public and private practitioners. Data are from a survey of doctors conducted by the authors.

Figure A.3: Other reasons for fee changes, Treated Doctors Relative to Gynecology



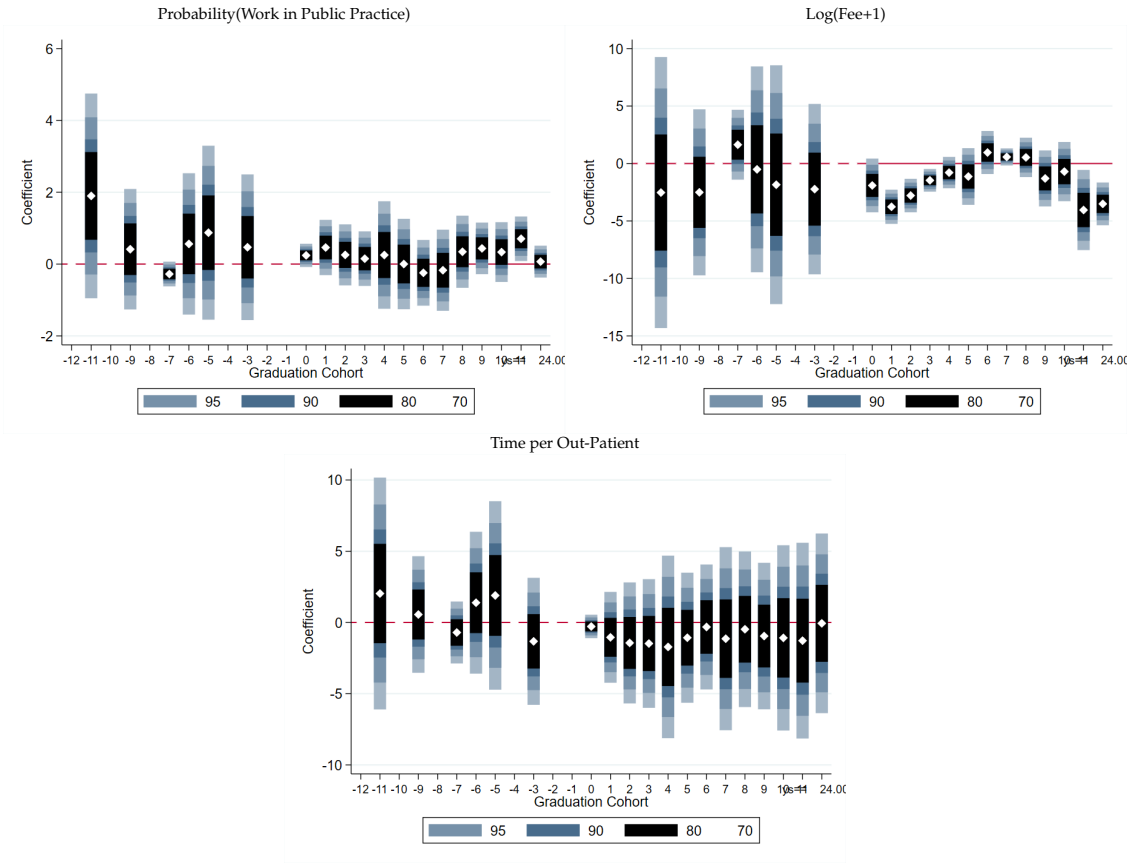
Note: The graph shows event studies of self-reported reasons for the gender pay gap, estimated using equation 3, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors conducted by the authors in collaboration with Gallup Pakistan.

Figure A.5: Event Studies, No Control



Note: The graph shows event studies of self-reported reasons for the gender pay gap, estimated using equation 1, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors conducted by the authors in collaboration with Gallup Pakistan.

Figure A.7: Event Studies, Female Doctors, No Control



Note: The graph shows event studies of self-reported reasons for the gender pay gap, estimated using equation 1, with graduation years grouped in two. Controls for age, age^2, treated, post and round fixed effects are included. Standard errors are clustered at the grouped specialty level. Data are from a survey of doctors conducted by the authors in collaboration with Gallup Pakistan.

A.2 Tables

	Mean (Post)	Mean (Pre)	Difference	SE	N
Age	36.12	57.21	21.10***	0.58	507
Urban Birthplace	0.74	0.61	-0.13*	0.07	166
Secondary School Score (%)	89.32	85.14	-4.19***	1.17	136
Middle School Score (%)	88.31	83.86	-4.45***	0.91	136
Mother's Education	11.70	12.36	0.66	0.50	166
Father's Education	12.84	13.21	0.37	0.34	166
No. Other Doctors	1.66	2.46	0.80**	0.36	166
Marriage Age	27.47	28.15	0.68*	0.36	144
Married	0.19	0.42	0.22***	0.04	541
Age at First Child	29.52	30.26	0.74*	0.38	141

Note: The table presents mean differences between medical doctors who graduated before and after the reform. Data are collected by the authors in collaboration with Gallup Pakistan in 2022-2023.

Table B.1: Background Statistics on Medical Graduates

	Mean (Private)	Mean (Public)	Difference	SE	N
High School Test Scores (%)	87.04	89.34	-2.30***	0.78	236
Probability(Female)	0.49	0.43	0.06	0.04	624
Age	43.59	42.87	0.71	0.92	625
Probability(Married)	0.31	0.40	-0.09**	0.04	627
Number of Children	1.69	1.96	-0.27*	0.15	244
Probability(Morning Shift)	0.64	0.71	-0.07	0.06	244
Probability(Afternoon Shift)	0.52	0.40	0.12*	0.06	244
Probability(Evening Shift)	0.29	0.25	0.04	0.06	244
Probability(Overnight Shift)	0.05	0.00	0.05**	0.02	244
Hours Worked	5.38	5.41	-0.03	0.31	244

Note: The table presents mean differences between medical doctors who work in public and private hospitals. Data are collected by the authors in 2022-2023.

Table B.2: Public and Private Hospital Doctors

	Struggle with Balance (1)	Balance affects Promotion (2)	Cut back Hours (3)	Struggle with Balance (4)	Balance affects Promotion (5)	Cut back Hours (6)	Struggle with Balance (7)	Balance affects Promotion (8)	Cut back Hours (9)
Panel A: All Doctors									
Non-Gyn x Post	0.12	0.23***	0.43***	0.09*	0.24***	0.28***	0.10	0.20**	0.28**
	(0.11)	(0.05)	(0.08)	(0.03)	(0.01)	(0.01)	(0.17)	(0.06)	(0.10)
Non-Gyn				0.00	-0.17***	-0.19***			
				(0.02)	(0.01)	(0.03)			
Observations	636	637	644	301	299	302	298	296	299
R^2	0.21	0.22	0.23	0.02	0.04	0.06	0.14	0.12	0.15
Panel B: Female Doctors									
Non-Gyn x Post	0.12	0.12	0.21	0.14**	0.34***	0.31***	0.30**	0.21	0.04
	(0.11)	(0.16)	(0.17)	(0.04)	(0.04)	(0.04)	(0.07)	(0.13)	(0.14)
Non-Gyn				0.20***	-0.04	-0.15			
				(0.03)	(0.02)	(0.09)			
Observations	289	290	292	110	109	110	110	109	110
R^2	0.42	0.35	0.42	0.13	0.08	0.05	0.34	0.28	0.34
Mean DV	0.5	0.2	0.3	0.5	0.2	0.3	0.5	0.2	0.3
Closer Years	N	N	N	Y	Y	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	N	N	N	Y	Y	Y

Note: The table presents the results of estimating 2 for self-reported work and life balance of medical doctors in treated fields relative to gynecology. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.3: Work-Life Balance, Treated Doctors Relative to Gynecology

	Probability of Working in:			
	Small, Public	Large, Public	Small, Private	Large, Private
Female x Post	0.04***	-0.04	0.05	-0.05
	(0.01)	(0.02)	(0.03)	(0.05)
Female	-0.03	-0.08**	0.07*	0.04
	(0.01)	(0.02)	(0.02)	(0.03)
Observations	154	154	154	154
R^2	0.03	0.10	0.09	0.13
Mean DV	0.5	0.9	0.8	0.6
Closer Years	N	N	N	Y
Fixed Effects	Y	Y	Y	Y
Ability Control	N	N	N	N

Note: The table presents results from a difference-in-differences regression where place of work is regressed on the interaction of gender and post. Individual terms for gender and post are included, as are controls for age, age^2, grouped speciality, graduation year and survey round fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, all other specialties and no specialty. The sample is restricted to treated (non-gynecology) fields. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered by gender. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.4: Did Females Displace Males in Certain Hospitals?

	Salary			Total Earnings		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Doctors						
Non-Gyn x Post	-0.58	-0.90*	-1.34***	0.01	-0.15	-0.27*
	(0.52)	(0.38)	(0.19)	(0.12)	(0.16)	(0.12)
Test Score (%)			0.12***			0.03**
			(0.03)			(0.01)
Observations	243	155	151	239	154	150
R^2	0.42	0.29	0.39	0.50	0.33	0.38
Panel B: Female Doctors						
Non-Gyn x Post	1.03**	-0.08	0.33***	-0.40*	-0.60***	-0.71***
	(0.25)	(0.07)	(0.04)	(0.18)	(0.09)	(0.03)
Test Score (%)			0.05***			0.04***
			(0.00)			(0.00)
Observations	112	65	62	109	64	61
R^2	0.60	0.49	0.49	0.66	0.68	0.71
Mean DV	1.7	1.7	1.7	13.3	13.3	13.3
Closer Years	N	Y	Y	N	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y
Ability Control	N	N	Y	N	N	Y

Note: The table presents the results of estimating 2 for the salary and earnings of medical doctors in treated fields relative to gynecology. "Salary" is a categorical variable for monthly salary, where each category represents Rs. 50,000 in salary. "Monthly Total Earnings" are created by first finding the midpoint of each salary categorical variable. For example, the midpoint of the salary range Rs."0-50,000" is Rs. 25,000. This midpoint is then added to the total fee earnings from both practices (Fee x number of patients consulted daily x 20 working days a month). Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age-squared, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. † For column 7, we removed specialty and graduation year fixed effects because of a small sample size. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.5: Salary, Treated Doctors Relative to Gynecology

	Probability(Promoted)		Gap due to Discrimination by			
			Employers		Patients	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-Gyn x Post	0.18***	0.18*	0.02	-0.20	0.36**	0.58**
	(0.01)	(0.09)	(0.16)	(0.13)	(0.07)	(0.02)
Observations	302	299	18	31	18	31
R^2	0.01	0.30	0.18	0.65	0.43	0.78
Mean DV	0.6	0.6	0.2	0.2	0.9	0.9
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	N	N	Y	Y

Note: The table presents estimates from equation 2 for potential explanations for the gender pay gap between medical doctors in treated fields relative to gynecology. Probability(Promoted) equals one if a respondent holds a position higher than of an Assistant Professor. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2 and survey round fixed effects. Data are from a survey of doctors conducted by the authors and Gallup Pakistan. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$..

Table B.6: Reasons for Zero Fee, Treated Doctors Relative to Gynecology

	Number of Out-Patients (1)	Time per Out-patient (2)	Number Out-Patients (3)	Time Out-patient (4)	Number Out-Patients (5)	Time Out-Patients (6)
Panel A: All Doctors, Primary Practice						
Non-Gyn x Post	-0.60	0.12	3.47	-0.10	7.66	-0.33
	(2.30)	(0.10)	(2.91)	(0.17)	(3.96)	(0.28)
Test Score (%)					-0.19	-0.04
					(0.39)	(0.03)
Observations	644	644	299	299	153	153
R^2	0.19	0.11	0.24	0.12	0.39	0.27
Panel A: Female Doctors, Primary Practice						
Non-Gyn x Post	5.57	-0.58***	20.14	-0.88***	2.27	-0.47***
	(7.65)	(0.10)	(16.32)	(0.18)	(1.91)	(0.07)
Test Score (%)					-1.40***	0.02**
					(0.10)	(0.00)
Observations	292	292	110	110	63	63
R^2	0.30	0.19	0.40	0.35	0.48	0.50
Panel A: All Doctors, Secondary Practice						
Non-Gyn x Post	6.24***	0.89***	8.57***	0.97***	6.13**	0.65**
	(1.08)	(0.18)	(1.09)	(0.18)	(2.11)	(0.21)
Test Score (%)					0.02	-0.05***
					(0.22)	(0.01)
Observations	644	644	299	299	153	153
R^2	0.13	0.14	0.12	0.14	0.29	0.27
Panel A: Female Doctors, Secondary Practice						
Non-Gyn x Post	10.31**	1.48**	11.02***	1.30*	4.19**	-0.09
	(2.92)	(0.48)	(2.22)	(0.51)	(0.77)	(0.13)
Test Score (%)					-0.50***	-0.12***
					(0.04)	(0.01)
Observations	292	292	110	110	63	63
R^2	0.23	0.23	0.22	0.18	0.36	0.33
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	Y	Y

Note: The table presents estimates from equation 2 for the number of patients consulted by doctors daily and the time spent on each patient. Estimates are presented separately for primary and secondary practices. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.7: Output at Primary and Secondary Practice, Treated Doctors Relative to Gynecology

	Hours per Week				Consulting	Hours per Week				Consulting
	Practice	Research	Teaching	Two Practices	Hours	Practice	Research	Teaching	Two Practices	Hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A: All Doctors										
Non-Gyn x Post	-0.26	0.09	0.06	0.42***	1.06***	0.08	-0.18	-0.12	0.32***	0.76**
	(0.19)	(0.24)	(0.13)	(0.06)	(0.21)	(0.22)	(0.23)	(0.21)	(0.06)	(0.26)
Test Score (%)						0.01	0.02	-0.00	-0.01	-0.02
						(0.03)	(0.01)	(0.03)	(0.00)	(0.08)
Observations	286	299	299	286	299	152	153	153	152	153
R^2	0.18	0.23	0.19	0.15	0.15	0.15	0.33	0.19	0.28	0.15
B: Female Doctors										
Non-Gyn x Post	-0.55	0.28	-0.12	0.59**	1.50	-0.18*	-0.30	-0.88**	0.04	-7.89***
	(0.50)	(0.37)	(0.14)	(0.21)	(1.63)	(0.07)	(0.14)	(0.24)	(0.04)	(0.12)
Test Score (%)						0.05***	0.03**	-0.06**	-0.03***	-0.16***
						(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Observations	106	110	110	106	110	62	63	63	62	63
R^2	0.28	0.35	0.36	0.23	0.21	0.61	0.60	0.48	0.36	0.35
Mean DV	40	6.5	7.5	0.34	6.06	40	6.5	7.5	0.34	6.06
Closer Years	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	Y	Y	Y	Y	Y

Note: The table presents estimates from equation 2 for hours worked. Practice, research and teaching hours are categorical variables where each category represents 20 hours, 10 hours and 10 hours for each variable, respectively. "Two practices" equals 1 if the respondent had a second practice. "Total hours worked" is the sum of hours at the respondent's primary and secondary practices. All regressions control for age, age-squared, and survey round fixed effects. Additional fixed effects included are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.8: Practice Hours, Treated Doctors Relative to Gynecology

	Hours Spent Consulting at					
	Primary	Secondary	Primary	Secondary	Primary	Secondary
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Doctors						
Non-Gyn x Post	-0.18	0.75***	0.09	0.97***	-0.14	0.90***
	(0.33)	(0.11)	(0.17)	(0.19)	(0.37)	(0.18)
Test Score (%)					0.02	-0.04
					(0.04)	(0.04)
Observations	644	644	299	299	153	153
R^2	0.14	0.14	0.14	0.12	0.17	0.22
Panel B: Female Doctors						
Non-Gyn x Post	-0.43	1.30**	0.07	1.43**	-8.36***	0.47*
	(1.27)	(0.36)	(1.26)	(0.47)	(0.05)	(0.16)
Test Score (%)					-0.03***	-0.13***
					(0.00)	(0.01)
Observations	292	292	110	110	63	63
R^2	0.27	0.24	0.28	0.14	0.38	0.32
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	N	N	Y	Y
Ability Control	N	N	N		N	Y

Note: The table presents estimates of equation 2 for the total number of daily consulting hours with patients at a primary and secondary practice (where applicable). All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.9: Total Consulting Hours, Treated Doctors Relative to Gynecology

	Public Hospitals				Private Hospitals			
	Pr(Fee=0) (1)	Log(Fee) (2)	Number OP (3)	Time OP (4)	Pr(Fee=0) (5)	Log(Fee) (6)	Number OP (7)	Time OP (8)
All Doctors								
Non-Gyn x Post	0.19	-0.34	-0.15	0.14	0.09*	0.38*	-0.30	0.75
	(0.17)	(0.79)	(0.15)	(5.98)	(0.05)	(0.17)	(0.23)	(2.60)
Observations	158	93	158	158	129	121	128	128
R^2	0.22	0.34	0.17	0.37	0.25	0.46	0.18	0.32
Female Doctors								
Non-Gyn x Post	0.67***	-0.79***	-0.04	-18.79***	0.00	0.25	-1.28*	-5.09
	(0.16)	(0.00)	(0.12)	(1.92)	(.)	(0.98)	(0.49)	(6.51)
Observations	57	36	58	58	48	47	48	48
R^2	0.64	0.66	0.64	0.58	1.00	0.57	0.41	0.68
Mean DV	0.25	4.9	32	13	0.25	4.9	32	13
Closer Years	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	N	N	N

Note: The table presents the results of estimating 2 for the fee and salary of medical doctors in treated fields relative to gynecology. "Log(Fee)" is defined for **non-zero fees**, while "Pr(Fee=0)" measures the probability that no fee is charged. All regressions control for age, age^2, survey round fixed effects and graduation year fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Closer years refers to a subsample of the data of doctors who graduated within 10 years of the medical school reform. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.10: Work Outcomes by Hospital Type

	Probability(Fee=0) (1)	Probability(Fee=0) (Public) (2)	Log(Fee>0) (3)	Public (4)	Number OP (5)	Time OP (6)
Female x Post	0.24**	0.83**	0.14	0.10*	9.14	-0.50
	(0.08)	(0.28)	(0.89)	(0.04)	(13.21)	(0.32)
Female	-0.25**	-0.78**	-0.36	-0.18	-7.35	0.49
	(0.10)	(0.29)	(0.61)	(0.19)	(5.86)	(0.42)
Observations	211	113	155	212	225	225
R^2	0.23	0.37	0.26	0.18	0.24	0.14
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	N	N	Y	Y
Ability Control	N	N	N		N	Y

Note: The table presents results on segmentation within treated fields. We interact an indicator for "Post" with an indicator for being female. Individual terms for post and female are included, as are controls for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.11: Comparing Men and Women in Treated Specialties

	Test Scores (%)	Father's Education	Mother's Education	# Doctors in Family	Urban Birth	Test Scores (%)	Father's Education	Mother's Education	# Doctors in Family	Urban Birth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Male Doctors Relative to Gynecology										
Non-Gyn x Post	2.68*	-0.92**	-1.30***	-0.84	-0.16	3.23**	0.06	0.29	-0.05	0.01
	(1.34)	(0.31)	(0.35)	(0.35)	(0.11)	(1.20)	(0.12)	(0.21)	(0.16)	(0.08)
Observations	216	219	219	219	219	145	146	146	146	146
R^2	0.43	0.28	0.47	0.54	0.36	0.14	0.20	0.29	0.25	0.20
Panel B: Male Doctors Relative to Urology										
Non-Gyn x Post	2.85	2.04**	-0.44	-0.60	0.03	4.31***	0.54	0.32	-0.39	-0.11
	(3.22)	(0.67)	(0.46)	(0.71)	(0.16)	(0.46)	(0.33)	(0.53)	(0.33)	(0.21)
Observations	132	135	135	135	135	90	91	91	91	91
R^2	0.47	0.39	0.57	0.64	0.42	0.13	0.28	0.36	0.20	0.11
Mean DV	87.3	13.0	12.0	2.13	0.64	87.6	13.2	12.6	2.17	0.56
Closer Years	N	N	N	N	N	Y	Y	Y	Y	Y
Specialty Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Graduation Year Fixed Effects	Y	Y	Y	Y	Y	N	N	N	N	N

Note: The table presents the results of estimating 2 for the selection of male doctors. All regressions control for age, age^2 and survey round fixed effects. Data are from a survey of doctors conducted by the authors and Gallup Pakistan. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.12: Selection, Treated Male Doctors

	Probability of Working in:								
	Public (1)	Urban (2)	Large (3)	Public (4)	Urban (5)	Large (6)	Public (7)	Urban (8)	Large (9)
1A: Male Doctors, Current Workplace Relative to Gynecology									
Non-Gyn x Post	0.14***	0.04	-0.06	0.30**	0.05	-0.07	0.24**	-0.03	-0.24**
	(0.04)	(0.04)	(0.09)	(0.10)	(0.05)	(0.04)	(0.09)	(0.08)	(0.07)
Test Score (%)							0.02***	0.00	0.02**
							(0.00)	(0.00)	(0.01)
Observations	479	479	479	254	254	254	145	145	145
R^2	0.19	0.15	0.26	0.14	0.22	0.20	0.26	0.27	0.27
1B: Male Doctors, Current Workplace Relative to Urology									
Non-Gyn x Post	0.12*	0.04	0.17*	-0.00	0.05	0.10	-0.06	-0.14**	-0.18
	(0.05)	(0.03)	(0.08)	(0.07)	(0.05)	(0.10)	(0.14)	(0.05)	(0.12)
Observations	332	332	332	180	180	180	90	90	90
R^2	0.23	0.18	0.32	0.19	0.23	0.22	0.33	0.37	0.43
2A: Male Doctors, First Workplace Relative to Gynecology									
Non-Gyn x Post	0.01	0.04	-0.02	0.19**	0.09	-0.01	0.23***	0.06	0.00
	(0.06)	(0.05)	(0.10)	(0.06)	(0.07)	(0.03)	(0.05)	(0.11)	(0.03)
Test Score (%)							-0.00	0.01	0.01
							(0.01)	(0.01)	(0.01)
Observations	497	497	497	263	263	263	145	145	145
R^2	0.20	0.16	0.23	0.11	0.14	0.12	0.17	0.29	0.14
2B: Male Doctors, First Workplace Relative to Urology									
Non-Gyn x Post	0.16***	0.07	0.05	-0.06	0.04	-0.02	-0.06	0.07	-0.11
	(0.03)	(0.07)	(0.04)	(0.04)	(0.10)	(0.05)	(0.10)	(0.27)	(0.07)
Observations	350	350	350	189	189	189	90	90	90
R^2	0.26	0.16	0.32	0.18	0.14	0.17	0.23	0.35	0.32
Mean DV	0.5	0.9	0.8	0.6	0.9	0.8	0.6	0.9	0.8
Closer Years	N	N	N	Y	Y	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	N	Y	Y	Y

Note: The table presents the results of estimating 2 for the place of work of male medical doctors in treated fields. All regressions control for age, age^2, grouped speciality, graduation year and survey round fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, all other specialties and no specialty. Stars represent statistical significance, standard errors are clustered at the specialty level. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.13: Place of Work, Treated Male Doctors

	Log(Fee) (1)	Pr(Fee=0) (2)	Log(Fee 2) (3)	Log(Fee) (4)	Pr(Fee=0) (5)	Log(Fee 2) (6)	Log(Fee) (7)	Pr(Fee=0) (8)	Log(Fee 2) (9)
Male Doctors Relative to Gynecology									
Non-Gyn x Post	0.33	0.03	0.48	-0.14	0.18	0.70*	-0.99	0.08	0.12
	(0.39)	(0.06)	(0.30)	(0.67)	(0.10)	(0.34)	(0.60)	(0.05)	(0.19)
Test Score (%)							0.06***	0.01	0.08**
							(0.01)	(0.01)	(0.02)
Observations	376	476	135	190	252	88	108	143	45
R^2	0.23	0.23	0.49	0.23	0.21	0.40	0.25	0.30	0.73
Male Doctors Relative to Urology									
Non-Gyn x Post	0.91*	0.01	-1.50	0.44	-0.09	-1.62	-0.61	-0.11	-0.21
	(0.45)	(0.08)	(1.05)	(0.25)	(0.12)	(0.97)	(0.72)	(0.19)	(0.24)
Test Score (%)							0.07***	0.01	0.03
							(0.02)	(0.00)	(0.01)
Observations	252	330	108	125	179	67	67	89	29
R^2	0.28	0.29	0.54	0.38	0.25	0.48	0.44	0.47	0.98
Mean DV	6.30	0.24	6.60	6.40	0.27	6.70	6.40	0.27	6.70
Closer Years	N	N	N	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	N	Y	Y	Y

Note: The table presents the results of estimating 2 for the fee of male medical doctors in treated fields. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.14: Pay, Treated Male Doctors

	Number of Out-Patients (1)	Time per Out-patient (2)	Number Out-Patients (3)	Time Out-patient (4)	Number Out-Patients (5)	Time Out-Patients (6)
Panel 1A: Male Doctors, Total Relative to Gynecology						
Non-Gyn x Post	7.03**	1.02***	10.59*	1.00***	12.72***	0.26
	(2.20)	(0.26)	(5.17)	(0.18)	(1.94)	(0.50)
Test Score (%)					-0.29	-0.10*
					(0.43)	(0.04)
Observations	498	498	263	263	145	145
R^2	0.20	0.17	0.20	0.18	0.39	0.33
Panel 1B: Male Doctors, Primary Practice Relative to Gynecology						
Non-Gyn x Post	1.28	0.20	1.55	-0.02	6.58	-0.43
	(1.73)	(0.19)	(4.53)	(0.24)	(3.50)	(0.23)
Test Score (%)					-0.26	-0.04
					(0.33)	(0.03)
Observations	498	498	263	263	145	145
R^2	0.23	0.14	0.23	0.16	0.39	0.27
Panel 1C: Male Doctors, Secondary Practice Relative to Gynecology						
Non-Gyn x Post	5.75***	0.82***	9.04***	1.03***	6.14	0.68*
	(1.24)	(0.08)	(1.88)	(0.15)	(3.20)	(0.33)
Test Score (%)					-0.03	-0.06**
					(0.17)	(0.02)
Observations	498	498	263	263	145	145
R^2	0.16	0.16	0.14	0.16	0.33	0.31
Panel 2A: Male Doctors, Total Relative to Urology						
Non-Gyn x Post	-6.65	-0.01	-13.46**	-0.29	-6.70	-0.14
	(5.21)	(0.26)	(4.14)	(0.35)	(11.51)	(1.26)
Test Score (%)					-0.39	-0.12**
					(0.68)	(0.05)
Observations	351	351	189	189	90	90
R^2	0.23	0.21	0.24	0.26	0.52	0.47
Panel 2B: Male Doctors, Primary Practice Relative to Urology						
Non-Gyn x Post	-6.27	0.03	-9.95**	0.43**	-9.38	0.39
	(4.49)	(0.14)	(3.81)	(0.16)	(8.90)	(0.63)
Test Score (%)					-0.18	-0.06
					(0.48)	(0.03)
Observations	332	331	180	180	90	90
R^2	0.25	0.18	0.28	0.19	0.47	0.28
Panel 1C: Male Doctors, Secondary Practice Relative to Urology						
Non-Gyn x Post	-0.49	-0.05	-1.18	-0.43	2.68	-0.53
	(0.96)	(0.21)	(0.71)	(0.29)	(3.20)	(0.67)
Test Score (%)					-0.21	-0.06**
					(0.22)	(0.02)
Observations	351	351	189	189	90	90
R^2	0.18	0.17	0.19	0.20	0.52	0.46
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	Y	Y

Note: The table presents the results of estimating 2 for the number of patients consulted by doctors and the time spent on each patient. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Data are from a survey of Pakistani doctors conducted by the authors. Stars represent statistical significance, standard errors are clustered at the specialty level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.15: Output at Primary and Secondary Practice, Male Doctors

	Morning (1)	Afternoon (2)	Evening (3)	Overnight (4)	Morning (5)	Afternoon (6)	Evening (7)	Overnight (8)
Panel A: Male Doctors Relative to Gynecology								
Non-Gyn x Post	0.05**	0.31***	0.27***	0.06***	0.09	0.23**	0.09	0.04**
	(0.01)	(0.02)	(0.02)	(0.00)	(0.19)	(0.07)	(0.18)	(0.01)
Test Score (%)					0.00	-0.00	-0.02	-0.00
					(0.01)	(0.02)	(0.01)	(0.00)
Observations	257	257	257	257	145	145	145	145
R^2	0.07	0.06	0.04	0.01	0.21	0.33	0.35	0.12
Panel B: Male Doctors Relative to Urology								
Non-Gyn x Post	0.07**	0.14***	0.01	0.03***	-0.01	0.00	-0.14	0.00
	(0.02)	(0.01)	(0.01)	(0.00)	(0.10)	(0.22)	(0.34)	(.)
Test Score (%)					0.01	-0.02*	-0.03***	0.00
					(0.01)	(0.01)	(0.01)	(.)
Observations	183	183	183	183	90	90	90	90
R^2	0.06	0.11	0.03	0.02	0.36	0.43	0.39	.
Mean DV	0.81	0.62	0.38	0.02	0.81	0.62	0.38	0.02
Closer Years	Y	Y	Y	Y	Y	Y	Y	Y
Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	Y	Y	Y	Y

Note: The table presents the results of estimating 2 on the timings of work shifts among treated fields relative to gynecology. Stars represent statistical significance, standard errors are clustered at the specialty level. All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. To limit the size of the table, only results from the sample of doctors who graduated within 10 years of the reform are shown. Data are from a survey of Pakistani doctors conducted by the authors. The mean of the dependent variable reported is for all doctors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.16: Work Timings, Male Doctors

	Hours per Week				Consulting	Hours per Week				Consulting
	Practice	Research	Teaching	Two Practices	Hours	Practice	Research	Teaching	Two Practices	Hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A: Male Doctors Relative to Gynecology										
Non-Gyn x Post	-0.20	-0.05	0.05	0.43***	1.11**	0.01	-0.21	-0.19	0.37**	1.10
	(0.19)	(0.19)	(0.13)	(0.08)	(0.37)	(0.19)	(0.24)	(0.20)	(0.11)	(0.58)
Test Score (%)						0.02	0.02	-0.00	-0.01**	0.00
						(0.03)	(0.01)	(0.03)	(0.00)	(0.06)
Observations	254	263	263	254	263	145	145	145	145	145
R^2	0.18	0.27	0.18	0.16	0.19	0.18	0.31	0.19	0.31	0.18
B: Male Doctors Relative to Urology										
Non-Gyn x Post	-0.20	-0.05	0.05	0.43***	1.11**	0.01	-0.21	-0.19	0.37**	1.10
	(0.19)	(0.19)	(0.13)	(0.08)	(0.37)	(0.19)	(0.24)	(0.20)	(0.11)	(0.58)
Test Score (%)						0.02	0.02	-0.00	-0.01**	0.00
						(0.03)	(0.01)	(0.03)	(0.00)	(0.06)
Observations	254	263	263	254	263	145	145	145	145	145
R^2	0.18	0.27	0.18	0.16	0.19	0.18	0.31	0.19	0.31	0.18
Mean DV	40	6.5	7.5	0.34	6.06	40	6.5	7.5	0.34	6.06
Closer Years	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ability Control	N	N	N	N	N	Y	Y	Y	Y	Y

Note: The table presents the results of estimating 2 for hours worked. Practice, research and teaching hours are categorical variables where each category represents 20 hours, 10 hours and 10 hours for each variable, respectively. "Two practices" equals 1 if the respondent had a second practice. "Total hours worked" is the sum of hours at the respondent's primary and secondary practices. All regressions control for age, age-squared, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Stars represent statistical significance, standard errors are clustered at the specialty level. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.17: Practice Hours, Male Doctors

	Hours Spent Consulting at					
	Primary	Secondary	Primary	Secondary	Primary	Secondary
	(1)	(2)	(3)	(4)	(5)	(6)
Male Doctors Relative to Urology						
Non-Gyn x Post	0.14	-0.07	0.06	-0.43	0.70	-0.08
	(0.45)	(0.12)	(0.49)	(0.23)	(0.76)	(0.68)
Test Score (%)					0.09**	-0.09
					(0.03)	(0.05)
Observations	351	351	189	189	90	90
R^2	0.20	0.17	0.23	0.18	0.33	0.40
Mean DV	32	13	32	13	32	13
Closer Years	N	N	Y	Y	Y	Y
Fixed Effects	Y	Y	N	N	Y	Y
Ability Control	N	N	N		N	Y

Note: The table presents the results of estimating 2 for the total number of hours consulting with patients at a primary and secondary practice (where applicable). All regressions control for age, age^2, and survey round fixed effects. Additional fixed effects indicated are graduation year and medical specialty group fixed effects. Specialty groups are: gynecology, cardiology, surgery, medicine, urology, all other specialties and no specialty. Stars represent statistical significance, standard errors are clustered at the specialty level. Data are from a survey of Pakistani doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.18: Total Consulting Hours, Male Doctors

	Struggle with Balance	Balance affects Promotion	Cut back Hours	Struggle with Balance	Balance affects Promotion	Cut back Hours	Struggle with Balance	Balance affects Promotion	Cut back Hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Men									
Non-Uro x Post	-0.38**	0.13**	-0.20*	-0.27***	0.11***	-0.14***	-0.35*	0.10	-0.20
	(0.12)	(0.04)	(0.08)	(0.02)	(0.00)	(0.01)	(0.16)	(0.08)	(0.10)
Non-Uro				0.13	-0.05	0.02			
				(0.06)	(0.04)	(0.07)			
Observations	346	346	351	191	190	192	188	187	189
R^2	0.23	0.24	0.31	0.10	0.03	0.10	0.27	0.16	0.26
Mean DV	0.5	0.2	0.3	0.5	0.2	0.3	0.5	0.2	0.3
Round FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Graduate Year FE	N	N	N	N	N	N	Y	Y	Y
Grouped Specialty FE	N	N	N	N	N	N	Y	Y	Y

Note: The table presents the results of estimating 2 for the work and life balance of medical doctors in treated fields relative to urology. The top panel is for all doctors and the lower panel for male doctors. All regressions control for age, age^2 and survey round fixed effects. Stars represent statistical significance, standard errors are clustered at the specialty level. Data are from a survey of doctors conducted by the authors. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table B.19: Balance, Male Doctors