Choice of Medical Specialty and Demographics. Economic Implications.

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Understanding specialty choice I

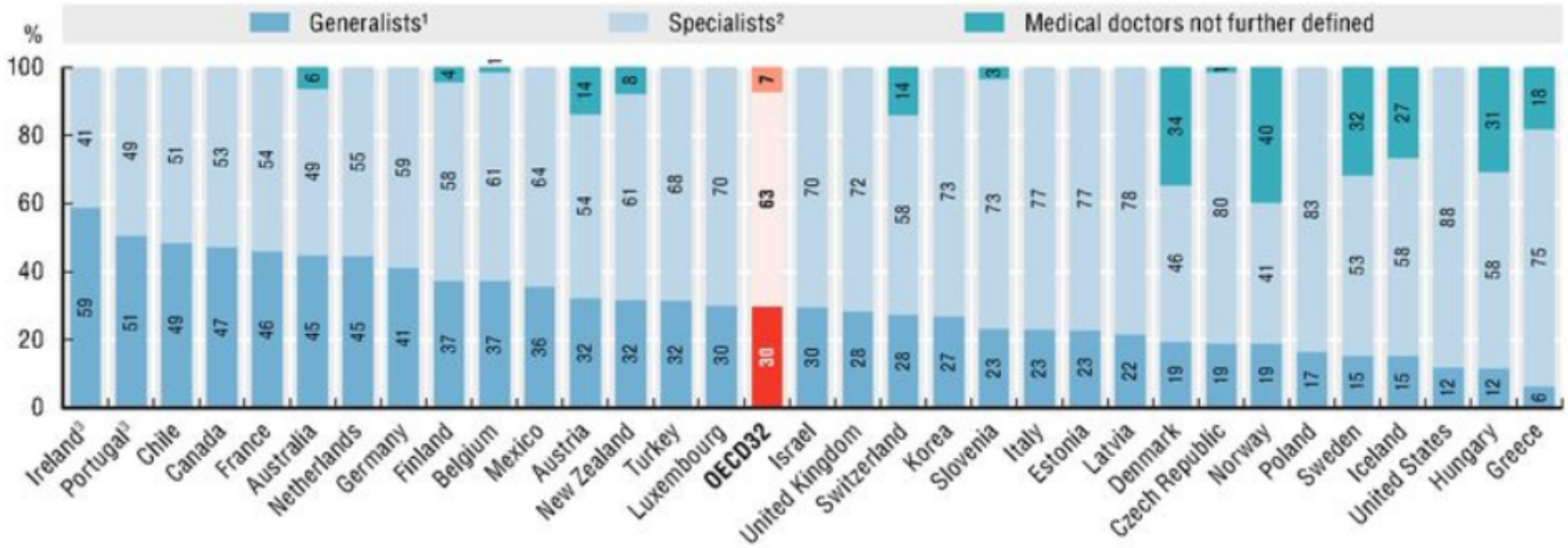
Understanding the drivers of specialty choice is key to the design of workforce planning strategies that lead to an optimal allocation of doctors.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*: The priorities on health workforce have shifted from broad concerns about widespread shortages to more specific issues such:

- The imbalance in the medical workforce $\rightarrow$ Notably the declining of general practitioners.
- The under-supply of health workers in certain geographic regions.
- Improving access to care and efficiency in health service delivery.

Understanding specialty choice II

8.7. Generalists and specialists as a share of all doctors, 2015 (or nearest year)

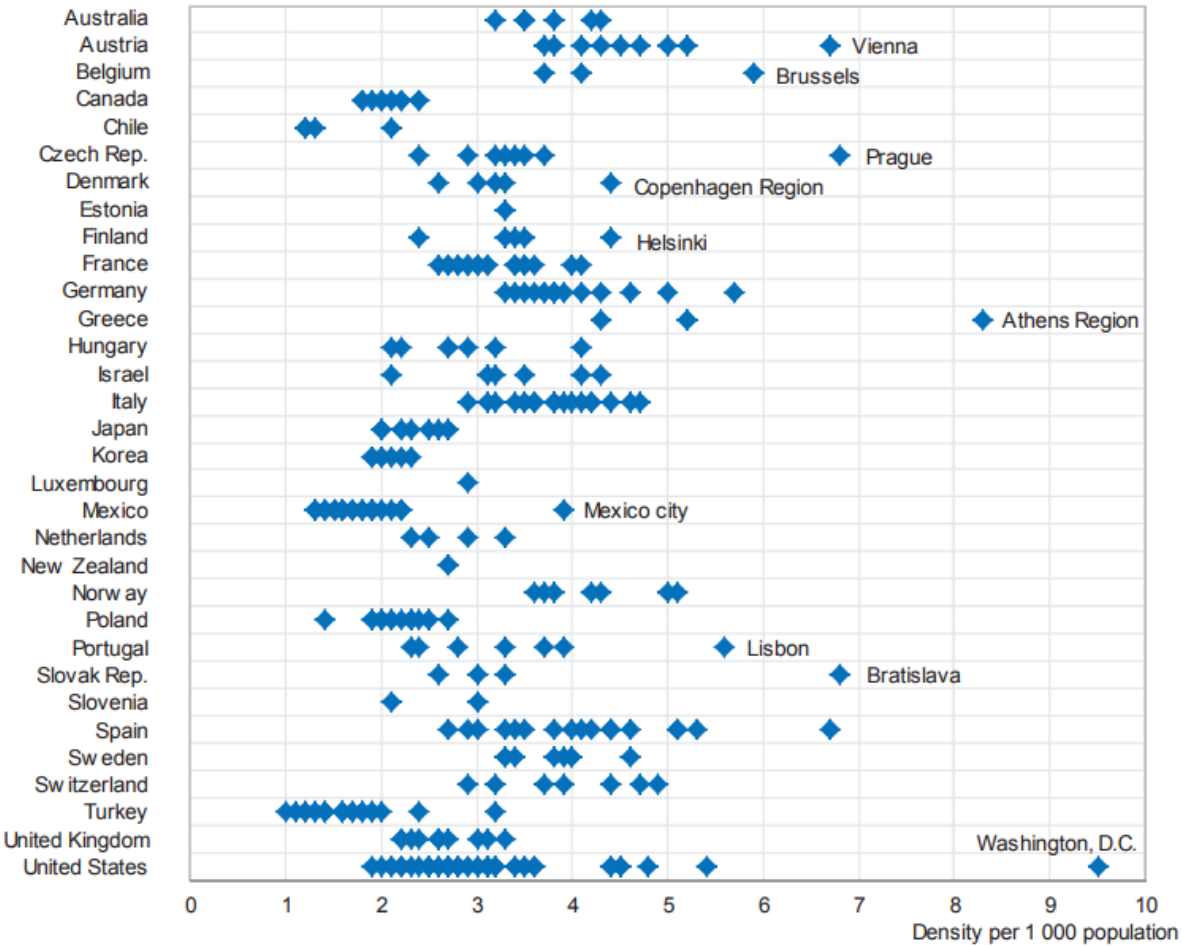


1. Generalists include general practitioners/family doctors and other generalist (non-specialist) medical practitioners.
2. Specialists include paediatricians, obstetricians/gynaecologists, psychiatrists, medical, surgical and other specialists.
3. In Ireland and Portugal, most generalists are not GPs ("family doctors"), but rather non-specialist doctors working in hospitals or other settings.

Source: OECD Health Statistics 2017.

Understanding specialty choice III

Figure 5.1. Physician density, by Territorial Level 2 regions, 2013 (or nearest year)



Note: Each observation (point) represents a territorial level 2 region (for example, *region* in France, *Länder* in Germany or *State* in the United States) in each country. The data for Chile relate to 2009 and do not reflect the increase in the number of physicians since then.

Source: OECD (2015), *Health at a Glance 2015: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/health_glance-2015-en.

Key aspects of specialty choice I

Nicholson (2008) defines the **three-key elements** that determine specialty choice:

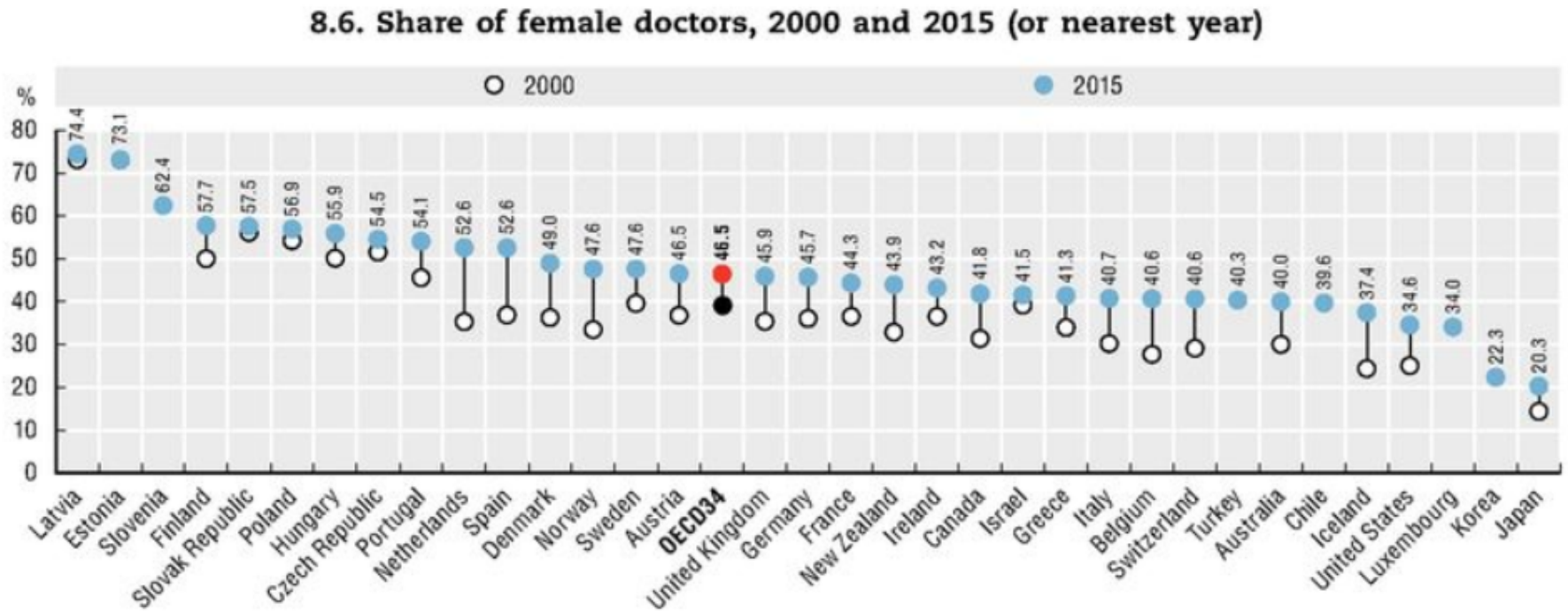
- **Monetary attributes**
  - US: Sloan (1970), Bazzoli (1985), Hurley (1991) or Nicholson (2002)→ different estimates of income elasticity of supply from 0 to 1.5.
  - Also positive effect of income on specialty choice found by Gagné and Léger (2005) for Canada and Sivey et al. (2012) for Australia.
- **Non-monetary attributes**
  - US: Thornton and Esposto (2003) positive impact for earnings, more vacation and more certain work schedules.
  - US: Bhattacharya (2005) years of training, schedules, reputation and skill mix required.
  - Spain: Harris et al. (2014) private practice earnings, prestige and favourable lifestyle.

Key aspects of specialty choice II

- **Doctors' personal characteristics**
  - UK : Goldacre et al. (2004), Lambert et al. (2006), Fazel and Ebmeier (2009), Goldacre et al. (2010).
  - EU: Soethout et al. (2004) enthusiasm, self-appraisal of skills or human interest, and domestic circumstances as main drivers of choice.
  - **Doctors' socio-demographic characteristics are likely to affect preferences and beliefs regarding monetary and non-monetary attributes.**

Changes in the composition of the medical workforce I

1. Feminisation of the medical workforce

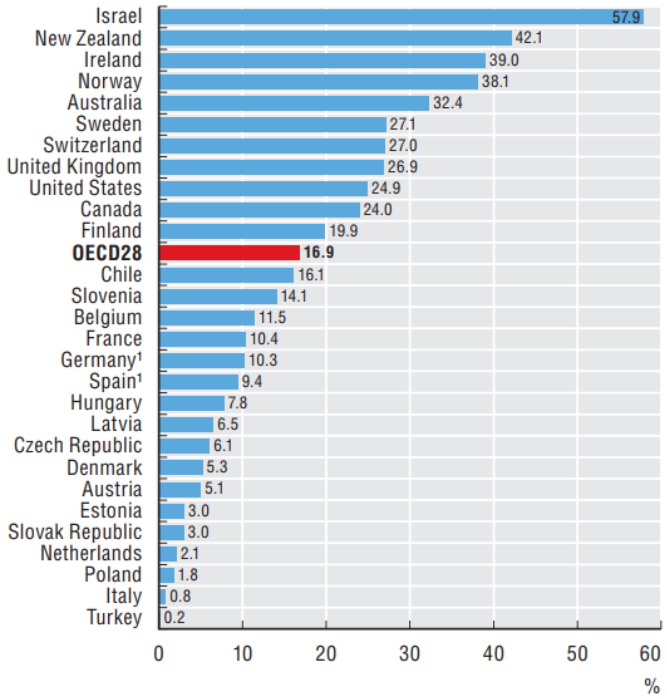


Source: OECD Health Statistics 2017.

Changes in the composition of the medical workforce II

2. Reliance on foreign-trained doctors

8.19. Share of foreign-trained doctors, 2015 (or nearest year)



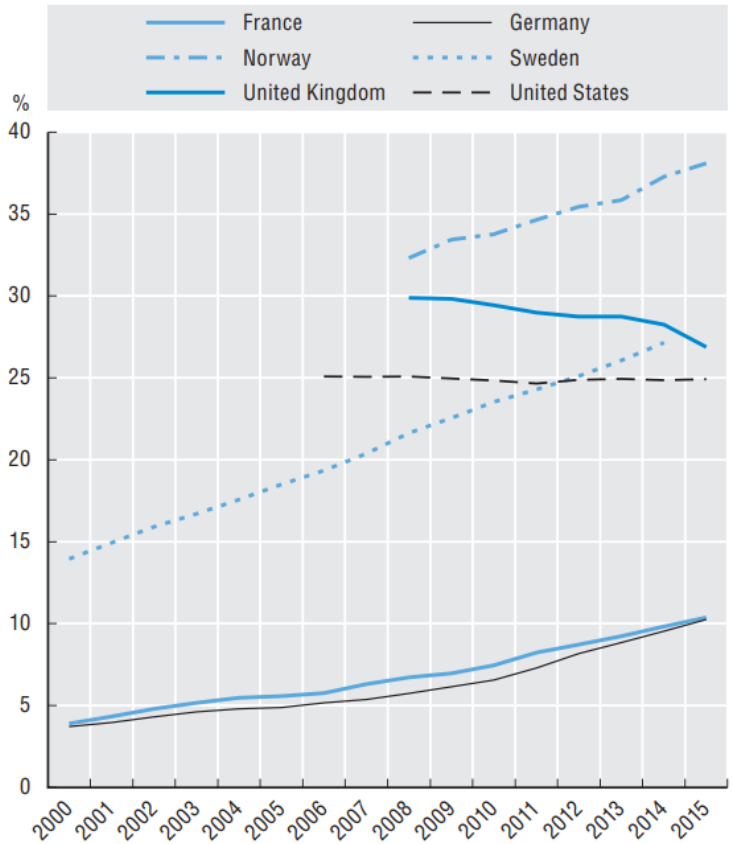
1. In Germany and some regions in Spain, the data are based on nationality (or place of birth in the case of Spain), not on the place of training.

Source: OECD Health Statistics 2017.

Changes in the composition of the medical workforce III

2. Reliance on foreign-trained doctors

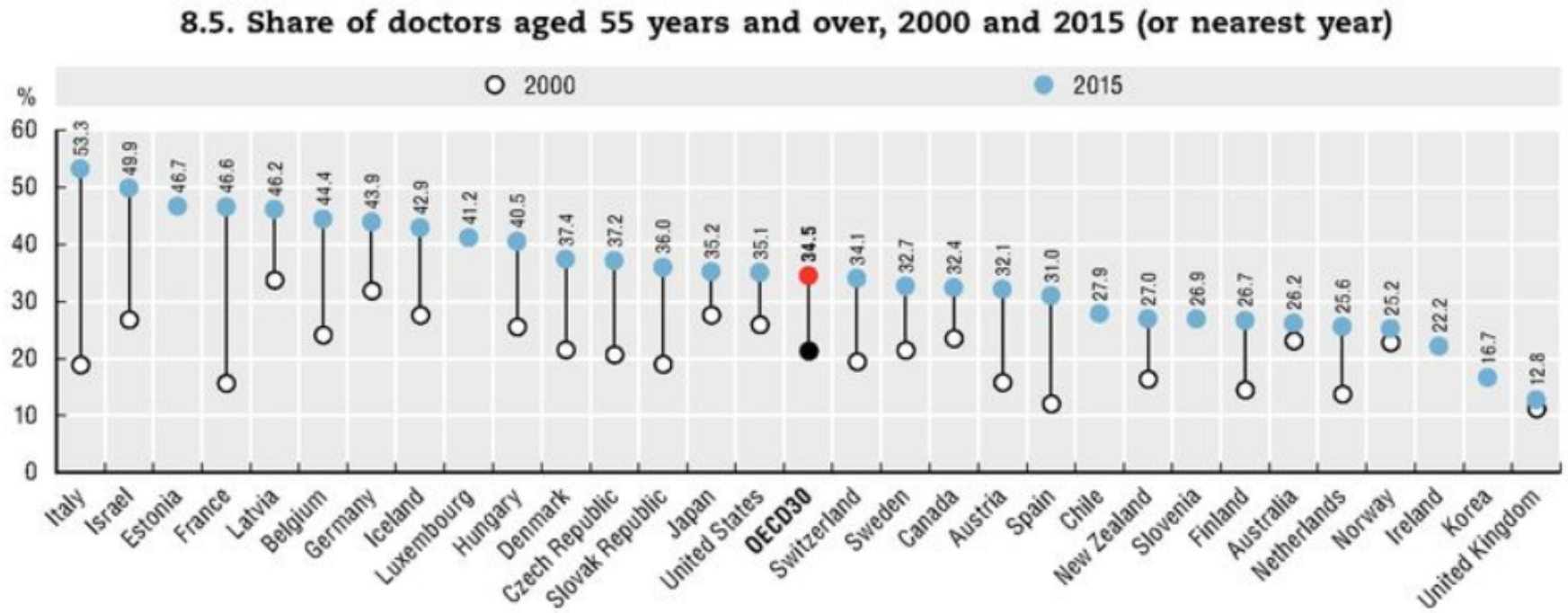
8.21. Evolution in the share of foreign-trained doctors, selected OECD countries, 2000 to 2015



Source: OECD Health Statistics 2017.

Changes in the composition of the medical workforce IV

3. Larger percentage of older doctors



Source: OECD Health Statistics 2017.

How did those changes affect the distribution of doctors across specialties? I

Social Mobility and Child Poverty Commission (2014): profession remains dominated by those from better-off socio-economic backgrounds and little has changed over time.

There is very unequal sorting of doctors across specialties in the UK (Rodriguez Santana and Chalkley 2017):

- Doctors in the most demanded specialties are more likely to be male, white, younger, from a UK university, from an independent school and to have educated parents.

How did those changes affect the distribution of doctors across specialties? II

- Doctors training in general practice and psychiatry, the two least demanded specialties, are more likely to be from an ethnic minority and to be older. Females are more likely to be training for GP and foreign educated doctors for psychiatry.
- Doctors training in the most demanded locations are more likely to be female, white and to be from a better-off socioeconomic background.
- Doctors in the least demanded locations, are more likely to be male, from an ethnic minority and have graduated overseas.

Why do we observe an unequal sorting of doctors?

- Difference in intrinsic preferences between socio-demographic groups
- Information asymmetries affecting doctors and (or) selectors:
  - Doctors can be affected by the self-fulfilling prophecy $\rightarrow$ Role of stereotypes.
  - Lack of role models.
  - Selectors might haver imperfect information about doctors, and group identity serves as a proxy for unobserved characteristics.
  - Selectors' unconscious biases.
- Existence of *entry barriers* in some specialties.
- Due to the design of the specialty allocation system.

Why do we observe an unequal sorting of doctors? - Evidence I

Analysis of the sequential specialty allocation process in the UK shows that (UKMED dataset):

- **Application Stage**
  - Female doctors self-select into **low-income** specialties (e.g. primary care specialties - AME 0.18) and away from high-income. Younger and ethnic minority doctors and those from better-off socioeconomic backgrounds apply more to **high-income** specialties (e.g. surgical specialties - AME 0.034 for BME; -0.004 for age and 0.029 for independent school).
  - Females, older doctors and those with worse academic attainment are more likely to apply to **run-through** specialities (AME 0.15 for females and 0.01 for age).
  - BME doctors make a larger number of applications other things equal (AME 0.06).

Why do we observe an unequal sorting of doctors? - Evidence II

- **Selection Stage**
  - Strong evidence of BME doctors scoring less highly than white doctors in the specialty allocation interview.
  - Female doctors score more highly than male doctors, however the effect is of a smaller magnitude.
  - Unexplained differences can be due to unobserved differences between groups or some type of discrimination.
  - Making multiple applications has a negative effect on interview scores.

Why do we observe an unequal sorting of doctors? - Evidence III

Table 3.16: Results of the aggregate Oaxaca-Blinder decomposition: ethnicity

	OB decomposition IS^{T1}				OB decomposition IS^{T2}			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Estimated Mean White doctors	0.5612***	0.5612***	0.5287***	0.5118***	0.2777***	0.2777***	0.2364***	0.2109***
	(0.0048)	(0.0048)	(0.0079)	(0.0088)	(0.0149)	(0.0149)	(0.0248)	(0.0286)
Estimated Mean BME doctors	0.4881***	0.4881***	0.4465***	0.4533***	0.0323	0.0323	-0.0299	-0.0075
	(0.0067)	(0.0068)	(0.0099)	(0.0110)	(0.0239)	(0.0239)	(0.0373)	(0.0422)
Difference	0.0731***	0.0731***	0.0823***	0.0585***	0.2454***	0.2454***	0.2663***	0.2183***
	(0.0083)	(0.0083)	(0.0127)	(0.0141)	(0.0281)	(0.0281)	(0.0448)	(0.0509)
Explained	0.0139***	0.0180**	0.0360***	0.0205	0.0513***	0.0358**	0.0667	0.0436
	(0.0042)	(0.0061)	(0.0109)	(0.0120)	(0.0129)	(0.0182)	(0.0343)	(0.0386)
Unexplained	0.0592***	0.0551***	0.0463***	0.0379**	0.1941***	0.2096***	0.1996***	0.1747**
	(0.0084)	(0.0081)	(0.0122)	(0.0134)	(0.0288)	(0.0303)	(0.0499)	(0.0559)
N	3,035	3,035	1,479	1,152	3,035	3,035	1,479	1,152
Demographic covariates	YES	YES	YES	YES	YES	YES	YES	YES
Socio-economic covariates	YES	YES	YES	YES	YES	YES	YES	YES
Medical School Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Foundation School Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Speciality Interview Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Shortlisting Score	NO	NO	YES	YES	NO	NO	YES	YES
UKCAT score	NO	NO	NO	YES	NO	NO	NO	YES

Robust standard errors in parenthesis
P-values: $***p < 0.01, **p < 0.05, *p < 0.1$

Why do we observe an unequal sorting of doctors? - Evidence IV

Table 3.17: Results of the aggregate Oaxaca-Blinder decomposition: gender

	OB decomposition IS^{T1}				OB decomposition IS^{T2}			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Estimated mean men	0.5233***	0.5233***	0.4832***	0.4700***	0.1492***	0.1492***	0.0818*	0.0618
	(0.0057)	(0.0057)	(0.0096)	(0.0108)	(0.0194)	(0.0194)	(0.0334)	(0.0393)
Estimated mean women	0.5497***	0.5497***	0.5126***	0.5064***	0.2403***	0.2403***	0.1897***	0.1862***
	(0.0054)	(0.0054)	(0.0083)	(0.0090)	(0.0170)	(0.0170)	(0.0268)	(0.0297)
Difference	-0.0265***	-0.0265***	-0.0294*	-0.0364**	-0.0911***	-0.0911***	-0.1079*	-0.1244*
	(0.0079)	(0.0079)	(0.0127)	(0.0141)	(0.0258)	(0.0258)	(0.0428)	(0.0493)
Explained	0.0118***	0.0070	0.0020	-0.0028	0.0230**	0.0217	0.0068	-0.0007
	(0.0032)	(0.0051)	(0.0091)	(0.0103)	(0.0087)	(0.0122)	(0.0230)	(0.0283)
Unexplained	-0.0382***	-0.0334***	-0.0314**	-0.0337**	-0.1141***	-0.1128***	-0.1147**	-0.1236**
	(0.0075)	(0.0069)	(0.0101)	(0.0114)	(0.0254)	(0.0257)	(0.0408)	(0.0461)
N	3,035	3,035	1,479	1,152	3,035	3,035	1,479	1,152
Demographic covariates	YES	YES	YES	YES	YES	YES	YES	YES
Socio-economic covariates	YES	YES	YES	YES	YES	YES	YES	YES
Medical School Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Foundation School Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Speciality Interview Dummies	NO	YES	YES	YES	NO	YES	YES	YES
Shortlisting Score	NO	NO	YES	YES	NO	NO	YES	YES
UKCAT score	NO	NO	NO	YES	NO	NO	NO	YES

Robust standard errors in parenthesis
P-values: $***p < 0.01, **p < 0.05, *p < 0.1$

Why do we observe an unequal sorting of doctors? - Evidence V

- **Role model effect in Spanish surgical specialties**:
  - Being exposed to female role models increases the probability of choosing a male-dominated surgical specialty of both men and women.
  - A SDev increase in the role model variable (0.161) augments the probability of choosing a male-dominated surgical specialty by 0.034 (all doctors), 0.059 (male only sample) and 0.026 (female sample)
  - However role model variable might be capturing other elements affecting decisions to specialize $\rightarrow$ Black Box (Neumark and Gardecki 1996)

Why is desirable an equal distribution of doctors across specialties? I

Regulators/ Policy Makers perspective

- General Medical Council (2010): medical profession should reflect not only appropriate skills but also a balance of social, economic, gender and ethnicity and be representative of the society they serve.

Economic aspects of the unequal sorting:

- **Earnings disparities**
  - Rimmer (2017): Gender pay gap has grown over the past decade in the UK. In 2006 female doctors working FT earned 24% less than males whilst in 2016 earned 34% less.
  - Arcidiacono and Nicholson (2005): the large male-female gap in earnings in US is due in large part to specialty choice.
  - Arrizabalaga et al.(2015) show evidence of the leaky pipeline phenomenon for Spain.

Why is desirable an equal distribution of doctors across specialties? II

- **Geographic imbalances in the distribution of doctors**
- **Differences in productivity across specialties**
  - Bloor et al. (2008): male doctors have higher activity rates than females after accounting for patients' case mix.
  - Simoens and Hurst (2006): evidence from EU females tend to work fewer hours than males, particularly during chilbearing age.
- **Shortages of specialists**
- **Lower quality of working experience**
  - UK:Foreign graduated doctors limited access to specialties $\rightarrow$ underclass of doctors in the NHS (Richards 1994 and Welsh 2000).

Why is desirable an equal distribution of doctors across specialties? III

- **Lower quality of care**
  - Patients treated by females have lower readmission and mortality rates (Tsugawa et al. 2017).
  - Females are more likely to adhere to clinical guidelines (Baumhakel et al. 2009).
  - Females provide preventive care more often (Lurie et al. 1993).

Conclusion

A more even distribution of doctors (at least for gender) across specialties could be a potential remedy for the current OECD policy concerns:

- The imbalance in the medical workforce $\rightarrow$ Notably the declining of general practitioners.
- The under-supply of health workers in certain geographic regions.
- Improving access to care and efficiency in health service delivery.

Future Research Ideas

- How can we improve the specialty allocation system?
  - Is there an optimal system valid for every country?
  - What are the private and public costs of the process?
- An analysis of the existing trade-off between specialty and location choices.
- Role of foreign trained doctors: Underclass in the NHS? What are the consequences of the latter on patient outcomes?
- Role model effects: further research to analyse what forms of mentoring might be the most productive.