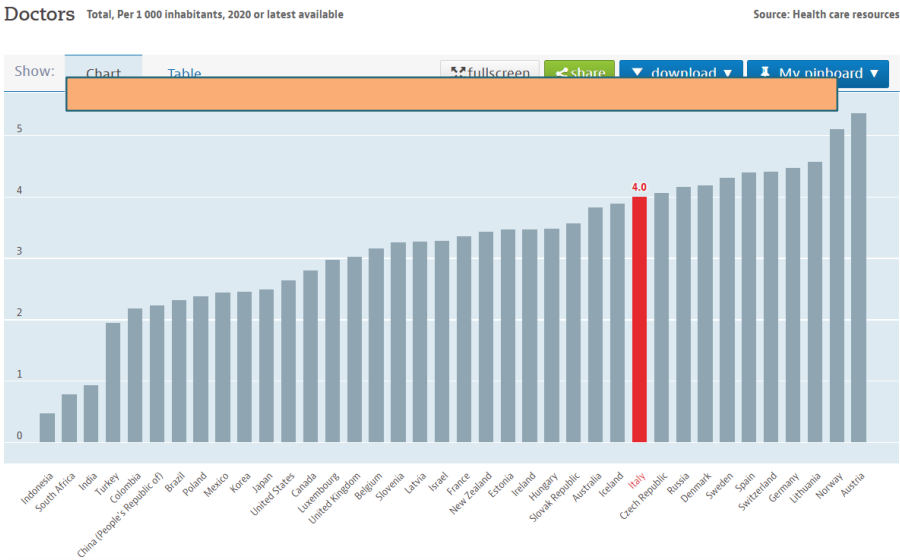
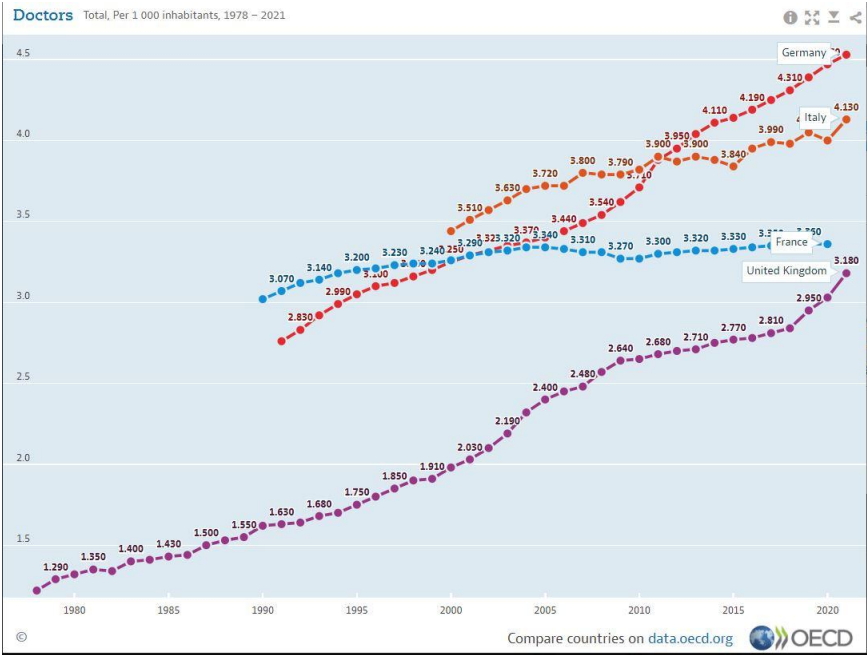
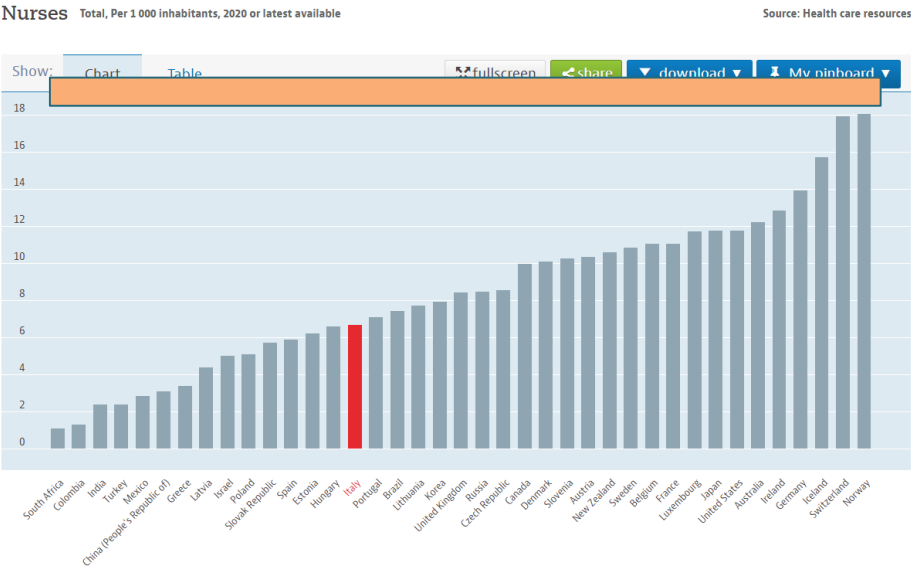


CHAPTER 5.2, 5.3 and 5.4
THE PHYSICIAN LABOR MARKET





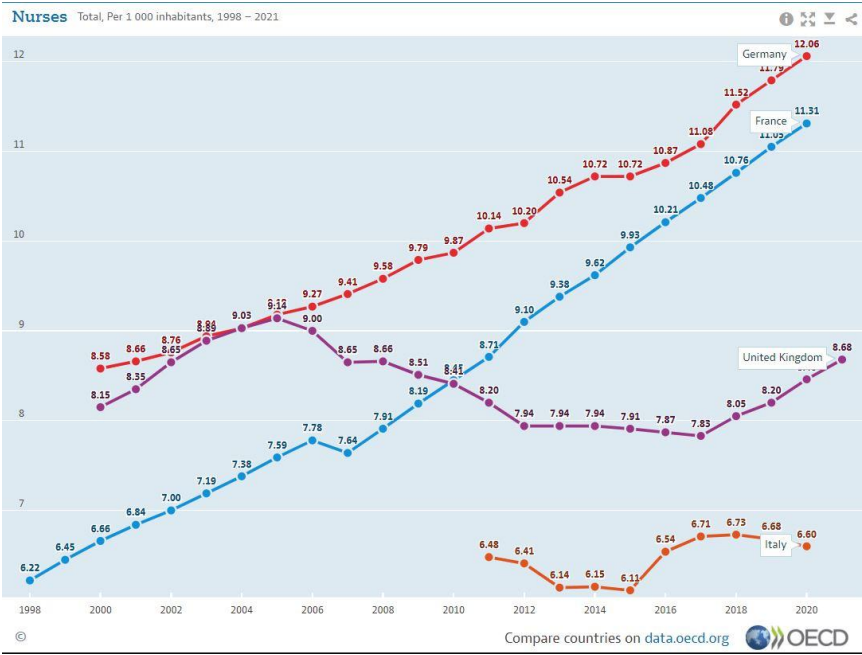
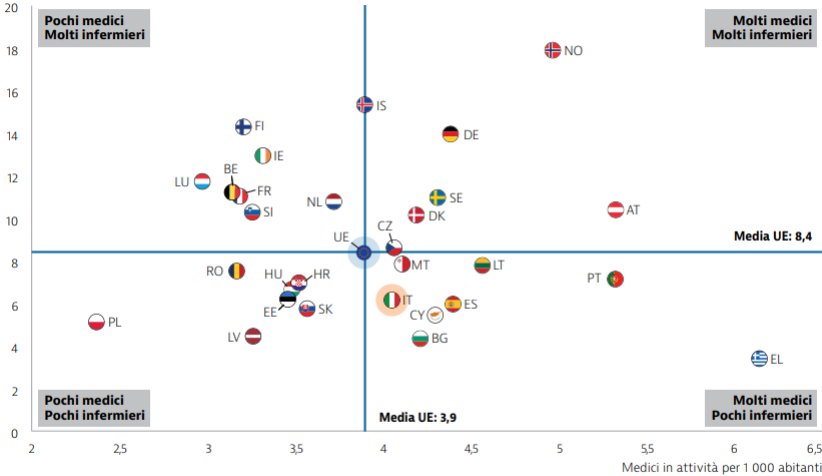


Gráfico 9. L'Italia presenta un numero relativamente elevato di medici, ma gli infermieri sono molto meno numerosi

Infermieri in attività per 1 000 abitanti

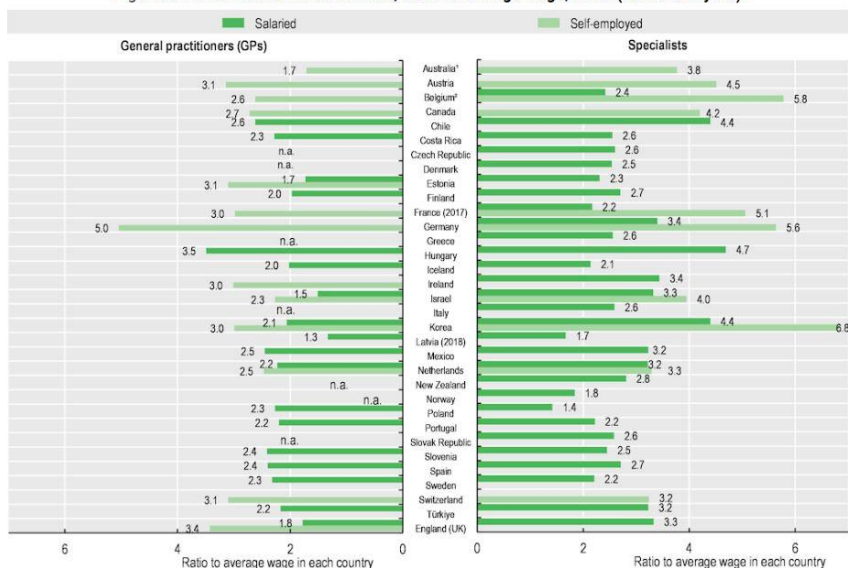


Nota: la media UE non è ponderata. Per il Portogallo e la Grecia i dati si riferiscono a tutti i medici abilitati; pertanto il numero dei medici in attività è fortemente sovrastimato (nel caso del Portogallo del 30 % circa). In Grecia il numero degli infermieri è sottostimato, in quanto i dati si riferiscono soltanto agli infermieri che lavorano nelle strutture ospedaliere.

Fonte: banca dati di Eurostat (i dati si riferiscono al 2019 o all'anno più vicino).

<https://www.oecd.org/italy/italia-profilo-della-sanita-2021-92056604-it.htm>

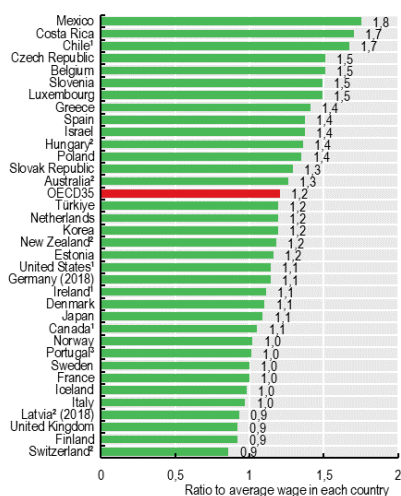
Figure 8.11. Remuneration of doctors, ratio to average wage, 2021 (or nearest year)



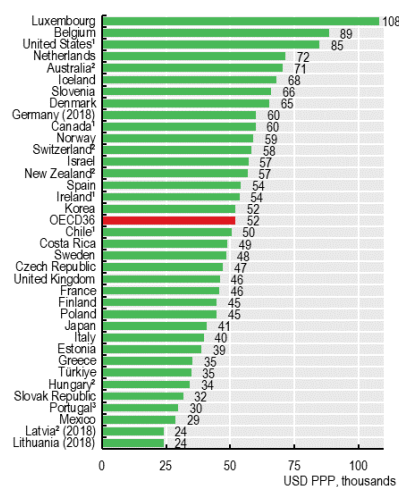
1. Includes physicians in training (resulting in an underestimation). 2. Includes practice expenses (resulting in an overestimation).

Source: OECD Health Statistics 2023 and OECD Employment Database 2023.

Remuneration of hospital nurses, ratio to average wage, 2021 (or nearest year)



Remuneration of hospital nurses, USD PPP, 2021 (or nearest year)



Labour market for physicians

- **New report reveals alarming shortage of country doctors** (The Guardian Sun 13 Oct 2019)
- **America's aging population is leading to a doctor shortage crisis** (CNBC SEP 6 2019)
- **Europe has a shortage of doctors**
<https://www.europeandatajournalism.eu/eng/News/Data-news/Europe-has-a-shortage-of-doctors>
- **The main reasons for the lack of doctors in Europe.**
 - ▣ The shortage of doctors has many causes: a large number of doctors reaching retirement age, too few new doctors being trained, too many specialists as opposed to general practitioners...

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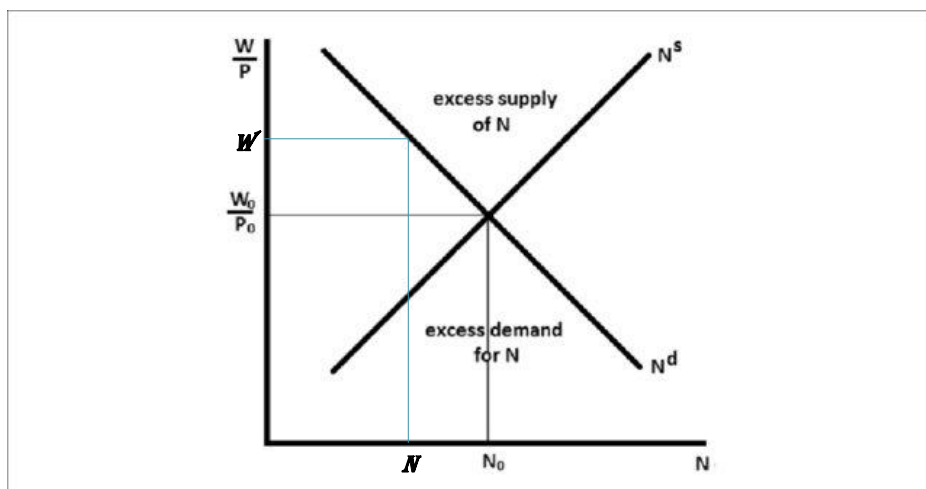
Labour market for physicians

- **Can a country have enough physicians and still experience a physician shortage?**
- Yes. There are three different types of physician shortages:
 - ▣ 1. Overall shortage: The total number of available physicians is insufficient to meet demand.
 - ▣ 2. Specialty or sector-specific shortage: Physicians are available, but there are shortages in certain medical specialties or sectors (e.g., public healthcare).
 - ▣ 3. Geographical shortage: Physicians are unevenly distributed across geographical areas.

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HEALTH WORKFORCE SHORTAGE KEY INDICATORS	
Indicator	Definition / Measurement
Job Vacancy Rate	$\text{Vacant positions} / (\text{occupied positions} + \text{vacant positions}) \times 100$
Unemployed-to-Vacancy Ratio	$\text{Registered unemployed qualified workers} / \text{registered vacancies} \times 100$
Vacancy Duration (Time-to-Fill)	Average days needed to fill a vacancy
Needs-Based Workforce Gap	<u>Estimated</u> required workforce – available workforce
Regional Workforce Density	Healthcare professionals per 1,000 inhabitants by region
Workforce Replacement Needs	<u>Expected</u> retirements and exits compared with workforce entrants
Healthcare Worker Turnover Rate	$\text{Workers leaving} / \text{average workforce} \times 100$
Workload Indicators	overtime hours; hours worked

A competitive labour market



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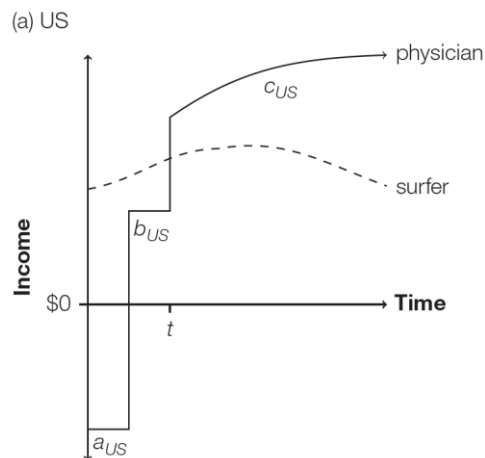
A non-competitive labour market

- Jobs are not all the same
 - ▣ Market segmentation
 - By medical specialty, employment sector (public vs. private), and geographical area.
 - ▣ $\rightarrow w_{GP} \neq w_S$
- Barriers to entry $\rightarrow$ restricted supply $\rightarrow$ potentially higher equilibrium wages [graph]
- Must consider lifetime cost and benefits $\rightarrow$ wage premium

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Returns to medical training

- Unlike most occupations, returns to medical training are very **back-loaded**
 - ▣ Medical school & residency expensive in direct costs and opportunity costs
- Individuals who place a higher value on future earnings may be more likely to choose a medical career.



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Net present value

- **Net present value** is a way of calculating value of all future streams of income (from today's perspective)

$$NPV = \sum_{t=0}^T \delta^t I(t)$$

- **Discount factor** δ is a measure of how much less an individual values future income over present income
 - ▣ δ lies between 0 and 1; small if impatient and large if patient
 - ▣ Those with high δ have high NPV from being a physician
 - ▣ Those with low δ have low NPV (and maybe even negative NPV)

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Discount factor

- Another way of expressing **discount factor** is:

$$\delta = 1/(1+r)$$

- ▣ Where **r** is the individual's **discount rate**, reflecting how much they value present income relative to future income.
 - ▣ Ex: $\delta = 0.90$ corresponds with $r = 0.11$
- More patient individuals have higher discount factors (δ) and lower discount rates (r)

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Internal rate of return (IRR)

- Consider two possible career choices **P** and **S** with incomes paths I_p and I_s
- **Internal rate of return r^*** is the discount rate which equalizes the NPV of both careers (or the difference between $NPV(p) - NPV(s) = 0$)

$$\sum_{t=0}^T \frac{I_p(t) - I_s(t)}{(1 + r^*)^t} = 0$$

- Individuals choose between careers by comparing their personal discount rate with the internal rate of return
- An individual with a personal discount rate equal to the IRR (r^*) values career P and career S equally.

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Exercise – Choosing between two careers

Consider two alternative careers and their net annual cash flows:

	Physician (P)	Software Engineer (S)
Year 0	–€100,000	€50,000
Year 1	€130,000	€50,000
Year 2	€170,000	€50,000

Questions

1. Calculate the NPV of each career at a discount rate of 10%.
2. Repeat the calculation at 25%. Does the preferred career change?
3. Find the IRR of choosing P instead of S.

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Barriers to entry

Barriers to entry may explain the high IRR

- In 19th century, becoming a doctor was simple
 - ▣ Anyone could do it, no regulation about training
- American Medical Association (1847)
 - ▣ Pre-req's for medical school
 - ▣ 4 years medical school
 - ▣ Require doctors to have a license to practice
 - ▣ 1910 Flexner Report helped shut down low-quality med schools
- Result: less med schools and less med students

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More barriers to entry

- Caps on medical school class size
- Doctors need license to practice on their own
 - ▣ International med graduates
 - Long and arduous process to practice in the US
 - ▣ Nurses and Physician Assistants
 - Limited in scope of practice
 - ▣ Alternative medicine
 - Chiropractors, acupuncturists, etc. need licensure too

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Tradeoffs from barriers to entry

- Because of barriers to entry, consumers have to pay above the competitive price
 - ▣ Entry barriers may generate **economic rents** for physicians
 - Def. wages above the competitive price due to artificial constraint of the market
- Barriers to entry ensure that physicians are qualified

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Physicians as agents

- Patients trust physicians to act as perfect agents for their health
 - ▣ Doctors' foremost concern should be patients' well-being
 - ▣ Not their own financial status or reputation
- Are doctors always *perfect* agents for their patients?

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Physician-induced demand (PID)

- Information asymmetry between doctor and patient
 - ▣ Patients cannot assess whether an extra test or procedure ordered by doctor is necessary
- Financial incentive for doctors to prescribe more services than needed
- Empirical evidence that when reimbursement rates for various procedures change, doctors prescription practices also change

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Defensive medicine

- Defensive medicine
 - ▣ *Overutilization* of testing and services
 - ▣ Protects against malpractice lawsuits
- Doctors fearful of lawsuit may overprescribe (and overcharge) for only marginally-useful procedures
- Mello et al. (2010) estimate that medical liability system in the US costs \$55.6 billion annually

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Conclusion

- Physician supply is highly regulated → Entry barriers may restrict supply and contribute to physician shortages.
- Investment returns to being a doctor and specializing is very high
- Physicians are not always perfect agents of care
 - ▣ Overutilization of care
 - ▣ Physician-induced demand and defensive medicine

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